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Emotion regulation in psychosis: exploring  
psychobiological markers and piloting an  
attachment and compassion-focused  
intervention.

by

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Submitted as part of the fulfilment of the requirements for the Degree of

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## **Declaration**

I hereby declare that:

- (a) I have composed the critical work
- (b) I have made a substantial contribution – clearly indicated – to each of the published papers
- (c) I have not submitted any of this work for any other degree or professional qualification but that this work has been published in the listed journals.

A handwritten signature in black ink, appearing to read 'C. Braehler', with a stylized, cursive script.

Christine Braehler

Munich  
October 2015

### **Abstract:**

“Non-affective” psychotic disorders are in fact associated with a high rate of emotional disorders. A number of attachment-based models of impairments in emotion regulation and mentalization in psychosis have been put forward. The present thesis aimed to explore psychobiological markers of emotion regulation in order to develop and pilot a novel psychological intervention.

The portfolio consists of six peer-reviewed published articles. Four studies were conducted involving 167 psychosis patients and 66 community controls resulting in four original articles, a theory paper and a metaanalysis. Paper 1-3 explored emotion regulation using different methods (self-report, hormonal, attachment-based narrative). Paper 4 lays out a compassion-focused model for promoting emotional recovery from psychosis. Paper 5 presents data from a feasibility trial of Group Compassion Focused Therapy. Paper 6 presents an updated attachment- and compassion-focused model of emotion regulation and mentalization in the context of a meta-analysis of effects of intranasal oxytocin on symptoms and social cognition in psychosis.

Childhood trauma – especially emotional abuse - was strongly associated with dissociation in psychosis patients compared to non-psychotic community controls – most strongly in chronic patients (Paper 1). Psychosis patients with childhood trauma showed significantly lower basal cortisol levels indicative of impaired stress regulation than those without childhood trauma (Paper 2). Impaired emotion regulation operationalised as attachment-based mentalisation was associated with problematic adolescent development and emotional and interpersonal adaptation to a first episode of psychosis in qualitative interviews. A novel attachment-based model for improving emotion regulation in psychosis by way of strengthening the care-giving/receiving and affiliation system through Compassion Focused Therapy (CFT) was put forward (Paper 4). A feasibility trial showed that group CFT was safe, well-accepted and associated with greater clinical improvement and greater increases in compassion compared to treatment as usual. Increases in

compassion in CFT were associated with reductions in shame, perceived social marginalisation, fear or relapse and depression (Paper 5). A meta-analysis of oxytocin administration as a biological way of strengthening the care-giving/receiving and affiliation system in psychosis was conducted yielding medium effects despite significant heterogeneity (Paper 6).

Findings replicated the strong association between childhood trauma and dissociation in psychosis patients relative to controls highlighting the importance of emotional abuse and suggesting underlying difficulties with regulating distress related to early interpersonal trauma. Lower basal cortisol in patients with childhood trauma appeared to support the presence of emotion regulation difficulties due to early interpersonal trauma on a physiological level. Qualitative findings helped to generate hypotheses about inhibitors and facilitators of recovery and targets for intervention including the moderating role of mentalization. A novel attachment- and compassion-focused model was outlined and successfully piloted yielding important signals of change such as increases in compassion, which appear to reduce depression and social marginalisation in particular. This model helped account for inconsistencies in oxytocin studies of psychosis.

In summary, findings extend existing research on emotion regulation in psychosis by supporting links to early interpersonal trauma and attachment and offer a promising novel attachment-and compassion-focused psychological intervention and a comprehensive biopsychosocial framework for further improving emotion regulation and mentalization in people with psychosis.

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### **Publications submitted as part of this thesis**

1. **Braehler, C.**, Valiquette, L., Holowka, D., Malla, A.K., Joobar, R., Ciampi, A., Pawliuk, N., & King, S., (2013) Childhood Trauma and Dissociation in First Episode Schizophrenia, Chronic Schizophrenia, and Community Controls. *Psychiatry Research*, 210(1), 36-42.
2. **Braehler, C.**, Holowka, D., Brunet, A., Beaulieu, S., Baptista, T., Debruille, J-B., Walker, C-D., King, S. (2005). Diurnal cortisol in schizophrenia patients with childhood trauma. *Schizophrenia Research*, 79 (2-3), 353-354.
3. **Braehler, C.** & Schwannauer, M. (2012). Recovering an Emerging Self: Exploring Reflective Function in Recovery from Adolescent-Onset Psychosis. *Psychology and Psychotherapy: Theory, Research and Practice*, 85 (1), 48-67.
4. Gumley, A., **Braehler, C.**, Laithwaite, H., MacBeth, A. & Gilbert, P. (2010). A compassion-focussed model of recovery after psychosis. *International Journal of Cognitive Psychotherapy*, 3(2), 186-201.
5. **Braehler, C.**, Gumley, A., Harper, J., Wallace, S., Norrie, J., & Gilbert, P. (2013). Exploring change processes in compassion focused therapy in psychosis: Results of a feasibility randomized controlled trial. *British Journal of Clinical Psychology*, 52(2), 199-214.
6. Gumley, A.I., **Braehler, C.**, MacBeth, A. (2014). A Meta-analysis and theoretical critique of Oxytocin and Psychosis: Prospects for attachment and compassion in promoting recovery. *British Journal of Clinical Psychology, Special Section* 52(1), 42-61.

## 1. Introduction

The term schizophrenia was first used and defined by the Swiss psychiatrist Eugen Bleuler in 1911. Bleuler discovered the seeming paradox that problematic affect regulation was in fact central to understanding the “nonaffective” psychotic disorders.

*“It has been known since the early years of modern psychiatry that an “acute curable” psychosis” became “chronic” when the affects began to disappear.” (Bleuler, 1950; p. 40).*

He hypothesized that people with psychosis were splitting off affectively charged complexes which maintained the illness. According to Bleuler, treatment was to involve humane care and compassionate engagement with affected individuals. With the arrival of biological psychiatry in the 1950s, however, antipsychotic medication became the first line of treatment and many of these early intuitive insights into the causes and treatments of psychosis were lost. With the arrival of experimental clinical psychology and cognitive behavioural therapies in the 1970s, research into the psychosocial mechanisms underlying psychopathology including psychosis began. In the 1990s the first CBT trials for psychosis were conducted based on emerging cognitive models of positive symptoms and on studies on family functioning following the onset of a psychosis. In 2002 the first guideline for the treatment of schizophrenia was issued in the UK by the National Institute for Health and Care Excellence (NICE) including a recommendation for CBT and family interventions alongside pharmacotherapy (NICE, 2002). In the late 1990s and early 2000s observations of high rates of adversity in people’s histories (Read, Perry, Moskowitz, & Connolly, 2001) as well as high rates of co-occurring emotional disorders (Birchwood, 2003) incited a genuine bio-psycho-social re-formulation of the development of and adaptation to psychosis and for the development of novel targeted psychological interventions (Read, Fink, Rudegeair, Felitti, & Whitfield, 2008). The third edition of the NICE guidelines advises to assess for and to treat emotional disorders and traumatic sequelae in people with psychosis (NICE, 2014).

The following research portfolio (2005 – 2013) explores processes of emotion regulation through different methodologies, offers an attachment-informed emotion-focused re-formulation of recovery from psychosis and trials a novel compassion-focused psychological therapy. Data were collected in the context of 1) a research project on psychosocial risk factors for schizophrenia at the Douglas Hospital University Research Center in Montreal, Canada, for which I worked as a research project coordinator, 2) as part of a doctoral thesis when working as a trainee clinical psychologist in an Early Psychosis Service in Edinburgh, UK, and 3) as part of a research project funded by NHS West of Scotland for which I acted as chief investigator when working as a clinical psychologist for the NHS Ayrshire & Arran in Scotland.

## **2. Childhood trauma and psychosis**

### **2.a The trauma-psychosis link**

Earlier scientific models of etiology posited that psychotic disorders were caused primarily by a genetic liability (Owen, Craddock, & O'Donovan, 2005) and efforts to identify candidate genes for schizophrenia have proven unsuccessful (Sanders et al., 2008). Behaviour-genetic studies demonstrated that the concordance rate between monozygotic twins was approximately 50% inciting research into gene-environment interactions in order to account for the remaining 50% of non-hereditary variance (Cannon, Kaprio, Lönnqvist, Huttunen, & Koskenvuo, 1998). The more gene-environment interactions of psychotic disorders were studied, the further researchers moved away from deterministic accounts of a stable disease entity called schizophrenia and the closer they moved towards a complex account of a generic liability for stress-sensitivity, which might be activated in certain social contexts across the life span (van Os, Kenis, & Rutten, 2010). Research into the link between early adversity and psychosis greatly contributed to the development of these more differentiated models of etiology of clusters of psychiatric symptoms associated with the psychosis spectrum.

Based on increasingly well-designed research over the past 15 years childhood trauma has been established as a major risk factor for psychosis. A review of 46 studies concluded that between 28% and 74% of people with psychosis had experienced emotional, physical or sexual abuse during childhood (Bendall, Jackson, Hulbert, & McGorry, 2008). Early correlational studies were criticized for relying on retrospective reports (Morgan & Fisher, 2007). Subsequent prospective and case-controlled studies have shown repeatedly that childhood trauma significantly increased a person's risk of developing psychosis compared to controls. A meta-analysis comprising 18 case-control studies, 10 prospective and 8 population-based cross-sectional studies found that childhood trauma was associated with an increased risk (odd ratio of 2.8, general population risk of psychosis were reduced by 33% if no childhood trauma) of developing psychosis even after controlling for potential confounding variables such as cannabis use, family history of

psychosis, co-morbid psychopathology, ethnicity and education level (Varese et al., 2012). All studies individually demonstrated a significant association. Nine out of 10 studies measuring severity of childhood trauma and psychosis found dose-response effects. In one prospective study, a first causal link between bullying and the onset of subclinical psychotic symptoms was observed in a cohort of 1,112 adolescents. Researchers noted that symptoms subsided after the bullying had stopped (Kelleher et al., 2008; Kelleher et al., 2012).

Elevated rates of childhood trauma are also observed in other psychiatric populations. Experiencing neglect or abuse when growing up appears to constitute a non-specific risk factor for developing a psychiatric disorder (Kessler et al., 2010). Subsequent research has explored to what extent the relationship between early adversities is specific to psychosis. Several studies have replicated the associations between childhood trauma and positive symptoms of hallucinations, delusions and thought disorder (Bebbington et al., 2011; Muenzenmaier et al., 2015; John Read, Agar, Argyle, & Aderhold, 2003; Shevlin, Dorahy, & Adamson, 2007). Voice-hearing in particular has been associated with a greater incidence of childhood trauma compared to non-clinical groups in a meta-analysis (Varese et al., 2012). Data from the National Comorbidity Survey showed specific associations between childhood rape and auditory hallucinations and receiving institutional care and paranoia in around 7000 participants (Bentall, Wickham, Shevlin, & Varese, 2012).

In summary, the relationship between childhood trauma and psychosis is robust (Varese et al., 2012), causal (Kelleher et al., 2008), is observed in the absence of a familial disposition (Arseneault et al., 2011; Janssen et al., 2004) and shows a dose-response effect (Varese et al., 2012) and some specificity between types of trauma and certain positive symptoms (Bentall et al., 2014).

What do we know about the psychological and biological mechanisms by which childhood trauma contributes to the development of psychotic symptoms?

## 2.b Childhood trauma and dissociation (Paper 1)

Dissociation has been put forward as a mediator between early adversity and psychosis (Moskowitz, Read, Farrelly, Rudegeair, & Williams, 2009). Childhood trauma is highly prevalent in both psychotic disorders, in dissociative disorders and in PTSD. Dissociation is considered to be a psychological sequel of early traumatic experiences. In a prospective longitudinal study of 168 young people childhood trauma predicted subsequent levels of dissociation (Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997). In the psychotherapy literature dissociation is commonly understood as an adaptive non-conscious short-term survival strategy that effectively reduces the physical and emotional pain associated during the initial traumatic experience and becomes itself a posttraumatic symptom in that patients dissociate when internal or external stimuli trigger unprocessed traumatic memories (Briere, 2006). Definitions vary greatly from pathological dissociation being defined as a lack of integrative function leading to a splitting of part of one's personality as seen in dissociative identity disorder (Nijenhuis, van der Hart, & Steele, 2010) to normal dissociation including more ordinary altered states of depersonalization (not feeling connected to reality, feeling numb), derealisation (world around seems not real or far away), absorption (imaginative involvement, daydreaming) and amnesia (brief absence) (Bernstein & Putnam, 1986).

One of the first studies to explore the associations between subtypes of childhood trauma and dissociation in people with psychosis was conducted by Holowka et al. (Holowka, King, Saheb, Pukall, & Brunet, 2003) in a sample of 26 patients with chronic schizophrenia using self-report measures (Childhood Trauma Questionnaire, CTQ; Dissociative Experience Scale, DES). Dissociation was significantly correlated with physical neglect, sexual abuse, emotional abuse and physical abuse. Associations with emotional abuse were the strongest ( $r=0.84$ ,  $p<0.001$ ). Other studies have consistently found positive associations between childhood trauma and dissociation in chronic and in first-episode patients. Across studies associations varied according to types of childhood trauma, gender and illness phase (Schäfer et

al., 2006; Varese, Barkus, & Bentall, 2012; Vogel et al., 2009). Only one study used a healthy control group to explore the specificity of this relationship to people with psychosis (Varese et al., 2012).

#### *2.b.i Aims & Methodology*

The aim of the study was to replicate the pilot study by Holowka et al. (Holowka et al., 2003) testing for associations between childhood trauma and dissociation using an improved design including a larger sample of patients, a group of first-episode patients, a community control group and to control for sex. A cross-sectional correlational design was used. Forty-three chronic psychosis patients, 61 first-episode patients and 66 community controls completed the Childhood Trauma Questionnaire (Bernstein & Fink, 1998) and the Dissociative Experiences Scale (Bernstein & Putnam, 1986).

#### *2.b.ii Personal contribution*

In 2002 I joined the laboratory at the Douglas Hospital Research Center in Montreal, Canada, as research assistant and coordinator, which had published the pilot data. I coordinated a research project into environmental and genetic risk factors for psychosis full-time for two years, which included a larger replication of the Holowka study. As part of this post, I set up the logistics of data collection, administered databases and reviewed the literature. Alongside other research assistants I collected and entered data from patients with psychosis over a period of two years for paper 1. I wrote the manuscript with statistical support from the principal investigator.

#### *2.b.iii Summary of paper*

Prevalence rates of moderate to severe childhood trauma were similar across all three groups: 53.5% chronic patients, 50.8% first episode patients and 43.9% community controls. Between-subjects analyses of variance revealed that there were no significant differences on the CTQ total or on any of its subscales between the three groups. Between subjects analyses of variance of the DES scores (and Bonferroni pairwise comparison) revealed significant differences between all three groups with chronic patient groups showing the highest DES scores, followed by first episode patients, followed by

community controls. Multivariate analyses revealed clearly that, even when controlling for group effects, the more severe any of the aspects of childhood trauma, the more severe the dissociative symptoms.

Table 1. Pearson correlation coefficients between various Childhood Trauma Questionnaire (CTQ) log-transformed scores and severity of dissociation (DES) for three groups of subjects (*in Braehler et al. (2013) Psychiatry Research, 210, 36-42.*).

	CTQ Score					
	Total	Emotional	Physical	Sexual	Emotional	Physical
	Trauma	Abuse	Abuse	Abuse	Neglect	Neglect
Community						
n = 66	0.299**	0.319***	0.073	0.348***	0.161	0.306**
First Episode						
n = 62	0.461***	0.476***	0.349***	0.350***	0.290*	0.180
Chronic						
n = 43	0.480***	0.653***	0.185	0.427***	0.106	0.393***

*Note.* One-tailed tests. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

As shown in Table 1, total trauma, emotional abuse and sexual abuse showed significant associations with dissociation in all three groups. Physical abuse and emotional neglect had a significant association in the first episode group only. Physical neglect correlated with dissociation for the chronic patient group and community controls only. Analyses of covariance revealed a main effect for both group and for total trauma (both  $p < 0.001$ ) but not for sex and significant interaction between group and total trauma ( $p = 0.018$ ), which increased variance in dissociation explained to 35%. Analyses of covariance revealed a main effect for both group ( $p < 0.001$ ) and for emotional abuse ( $p < 0.001$ ) and a significant interaction effect for Group-by-Emotional Abuse ( $p < 0.001$ ) which explained 45% of the variance in DES. Emotional abuse



emerged as the most powerful dimension of childhood trauma in explaining variance in dissociation. After partialling out sex, the strongest association was found in chronic patients ( $r=0.655$ ,  $p<0.001$ ), followed by first-episode patients ( $r=0.486$ ,  $p<0.001$ ) followed by controls ( $r=0.323$ ,  $p<0.01$ ). Being a chronic patient and having experienced early emotional abuse was associated most strongly with dissociation. The chronic group also had the strongest association between dissociation and both total trauma and physical neglect. There were no significant sex differences in dissociative symptoms, although results showed that the correlation between physical neglect and dissociation was significant in men, but not women irrespective of group. Taken together, this study replicated pilot findings on the strong association between childhood trauma – in particular of emotional abuse – with dissociation in psychosis extending this to a first-episode sample.

Interestingly, the association between childhood trauma and dissociation was present across clinical and non-clinical groups despite being the strongest in the chronic group. The strength of this association in patient groups suggest that models of trauma processing may add to the understanding of the development and adaptation to psychosis. Whilst this paper further supports the non-specific childhood trauma – dissociation link in people with psychosis using larger patient samples than previous studies and including a control group, we were unable to establish causality due to the cross-sectional design and were unable to explore links to clinical symptoms or other aspects of emotion regulation.

## 2.c Childhood trauma and HPA-Axis Functioning in Psychosis (Paper 2)

Backed by emerging data on high rates of childhood trauma in psychosis (reviewed above), John Read proposed a reconceptualization of the predominant vulnerability- stress model of psychosis (Read et al., 2003; Read et al., 2001). Instead of considering early adversity to act as a stressor that activates an underlying biological vulnerability, Read hypothesized that the

biological consequences of early adversity constitute a vulnerability which predisposed to the development of psychosis (Heim & Nemeroff, 1999; Read et al., 2001). According to the “traumagenic neurodevelopmental model”, it was hypothesized that early adversity caused neurodevelopmental abnormalities or HPA-axis dysregulation which would render individuals vulnerable to later stressors. The hypothalamic-pituitary-adrenal-axis (HPA-axis) is a neuroendocrine pathway central to the human stress response. The stress response consists of a homeostatic feedback loop between the hypothalamus secreting corticotrophin-releasing hormone (CRH), followed by the anterior pituitary secreting adrenocorticotrophic hormone (ACTH), and finally by the adrenal cortices secreting cortisol, which in turn feedback to hypothalamus, pituitary, amygdala, hippocampus and prefrontal cortex to coordinate a highly integrated and adaptive stress response within the cardiovascular, metabolic, immune, reproductive and central nervous systems. The function of the HPA axis has evolved to respond effectively to acute resolvable stress as opposed to chronic unresolvable stress. Ongoing inescapable stress such as emotional abuse within the family or social disadvantage typically manifests in elevated cortisol levels, which in turn have toxic effects on the neural structures involved and a subsequently compromised HPA-axis function. Early life stress in animals such as maternal separation or low maternal care has been shown to *“induce persistent structural, functional and epigenomic changes in neural circuits that are implicated in the integration of cognitive and emotional processing, endocrine-autonomic control, and the regulation of arousal and vigilance.”* (Heim, Newport, Mletzko, Miller, & Nemeroff, 2008) p.694).

Animal studies demonstrated that the subsequent changes converge into increased stress reactivity, anhedonia, anxiety, sleep difficulties, greater pain sensitivity and cognitive impairment resembling symptoms of general psychopathology in humans (Sanchez, Ladd, & Plotsky, 2001).

### 2.c.i Aim & methodology

To explicitly test the “traumagenic neurodevelopmental model”, HPA-axis function measured by diurnal salivary cortisol in psychosis patients with and

without childhood trauma was compared. During the study (2002-2004) only limited and inconsistent findings on HPA-axis functioning in psychosis were available (Walker & Diforio, 1997). Given low basal cortisol in PTSD (Yehuda, McFarlane, & Shalev) and in female rape survivors with a prior assault history (Resnick, Yehuda, Pitman, & Foy, 1995), we hypothesized that schizophrenia patients with self-reported childhood trauma may show lower basal cortisol than patients without.

#### *2.c.ii Personal contribution*

I collected, entered and analysed the data and wrote the manuscript. Cortisol assays were analysed by collaborators from a psycho-endocrinology laboratory.

#### *2.c.iii Summary of paper*

Fourteen medicated outpatients who met diagnostic criteria for schizophrenia completed the Childhood Trauma Questionnaire (CTQ) and collected salivary cortisol at home at seven time points over a 24-hour period. Seven patients reported moderate to severe childhood trauma (CT group) and seven patients reported none to minimal childhood trauma (NCT group). The CT group had significantly lower cortisol in the first hour after waking than the NCT group (30min,  $p=0.02$ ; 60min= $0.017$ ) (see Figure 1). Morning cortisol levels were significantly negatively associated with emotional abuse and sexual abuse. The more emotional or sexual abuse patients had experienced the lower their basal cortisol in the hour after waking. Despite the small sample size, these preliminary data suggest that differences in morning cortisol between psychosis patients may be associated with their experiences of childhood trauma, in particular of emotional and sexual abuse. These results were the first to explicitly test and provide support for the traumagenic neurodevelopmental model by Read et al. (Read et al., 2001).

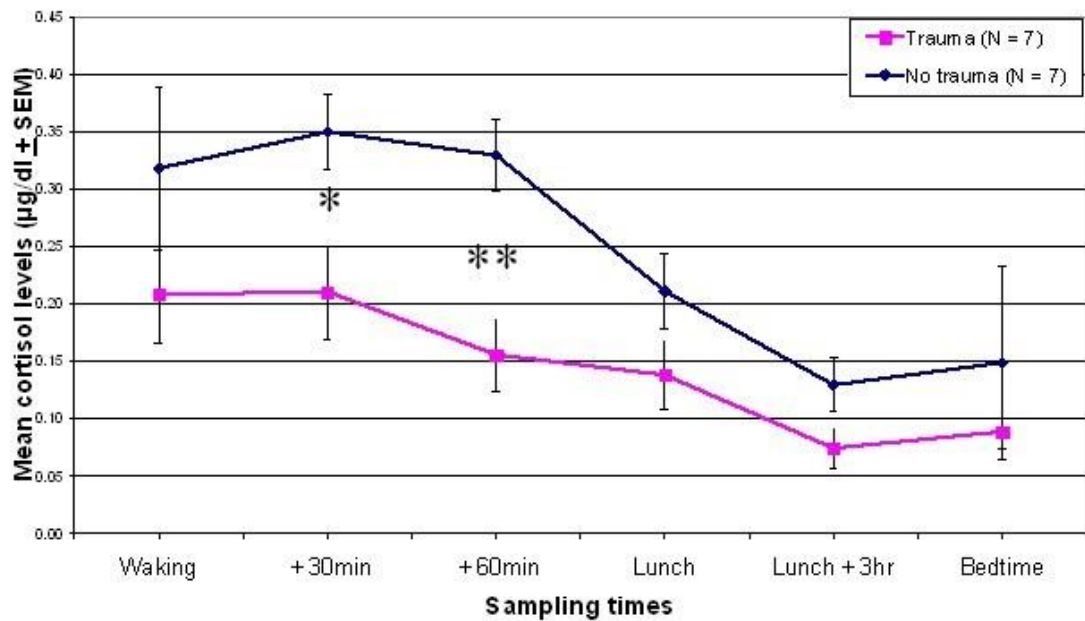


Figure 1. Mean (S.E.M.) salivary cortisol levels as a function of childhood trauma, group and time of collection. Intervals between sampling are not scaled equally. (\*Significant at the 0.05 level (two-tailed)).

## 2.d Discussion (Paper 1, Paper 2)

Findings of Paper 1 replicated the strong association between childhood trauma and dissociation in psychosis patients relative to controls highlighting the importance of the impact of emotional abuse and suggesting underlying difficulties with regulating distress related to early interpersonal trauma. Lower basal cortisol in patients with childhood trauma as reported in Paper 2 appeared to support the presence of emotion regulation difficulties due to early interpersonal trauma on a physiological level.

Paper 1 replicates the association between childhood trauma and dissociation in the largest patient group to date including a first-episode sample and control group. An interesting finding of this study is that the link between childhood trauma and dissociative symptoms seems to transcend the presence of a diagnosis of a psychotic disorder seemingly supporting the non-specific nature of the association. However, the associations were clearly stronger in the patient groups as they reported greater levels of dissociation. The greater dissociation in chronic patients might be due to additional traumatic experiences after childhood, which we did not take into account. Lifetime

trauma as a result of assault, victimization (Bebbington et al., 2011) or coercive service responses during hospitalisation or to the psychosis itself are common (Frame, 2001).

Research on trauma has shown that emotion dysregulation is a key mediator between trauma and dissociation across psychiatric disorders (Briere, 2006). In keeping with a trauma model, the high rate of trauma in chronic patients and the strong association with dissociation might be indicative of underlying difficulties in emotion regulation. These individuals might have adapted to trauma by “tuning out”, not feeling their bodies and cutting themselves off from unpleasant emotions like shame or fear or loneliness in persistently threatening and inescapable situations. Dissociation has been shown to mediate between childhood trauma and hallucination proneness suggesting that this “tuning out” could lead to greater positive symptoms (Varese, Barkus, & Bentall, 2011). Other individuals with psychosis might have adapted differently to childhood trauma as Vogel and colleagues suggest (Vogel et al., 2011). They failed to replicate the link between CTQ and DES in psychotic patients but found a link between CTQ and negative symptoms instead. They concluded that negative symptoms themselves represent an alternative adaptive response to childhood trauma – a constant state of downregulation of emotion and social engagement. Taken together, the strong trauma-dissociation link might be indicative of one specific trauma-related pathway to psychosis. Other emotion regulation strategies within psychosis need to be explored to better understand different affective and cognitive pathways.

Emotional abuse stands out as having a particularly strong link to dissociation in patients with a chronic psychosis when compared to controls, which supports previous findings by other groups (Schäfer et al., 2006) ; (Üçok & Bıkmaz, 2007). Emotional abuse such as being bullied, humiliated by one’s caregivers (CTQ Item 18: “I felt that someone in my family hated me.” CTQ Item 3: “People in my family called me things like “stupid”, “lazy”, or “ugly”) or being an unwanted child (CTQ Item: “I thought that my parents wished I had never been born.”) are established risk factors for developing

schizophrenia ( Bebbington et al., 2004; Myhrman, Rantakallio, Isohanni, Jones, & Partanen, 1996) . Verbal aggression from parents has been shown to be a more potent predictor of symptoms than physical or sexual abuse or witnessing violence suggesting that emotional abuse can be as damaging as physical forms of abuse in general (Teicher, Samson, Polcari, & McGreenery, 2006). We also know that prolonged relational trauma (such as verbal abuse by parent) during early phases of childhood as opposed to non-interpersonal trauma has a more detrimental emotional impact in terms of greater symptom load (Lanius, Vermetten, & Pain, 2010). A prospective study showed that the development of psychosis symptoms at 12 years old was predicted by maltreatment marked by another human intending to harm the child as opposed to impersonal and unintentional traumatic events like accidents (Arseneault et al., 2011). Taken together, prolonged interpersonal trauma involving emotional abuse and the intention to harm appears to have the most devastating consequences on an individual.

It therefore seems critical to consider the relational context in which the adversity occurs, the emotions and mind states conveyed and how these are processed emotionally by the victimized person. If the abuse or neglect is committed by an attachment figure on whom the child relies for safety, subsistence, affection and for the internalization of his or her sense of self, then the child experiences major internal conflict and inescapable distress especially if no alternative attachment figure is available to turn to. If, however, the abuse or neglect is committed by non-attachment figures, the child has an opportunity to process and integrate these difficult emotions especially with the support of attachment figures that strengthen a positive sense of self in the child. Equally, if the child does not feel safe to show distress or approach attachment figures regardless by whom they were traumatized it is less likely to emotionally process the distress.

Paper 2 provides preliminary evidence for the presence of HPA-axis dysregulation in individuals with psychosis as a function of experience of childhood trauma – in particular of emotional abuse. Cortisol after awakening

in participants with CT was significantly reduced or blunted compared to participants without CT.

Research published since the inception of this small study has further substantiated the link between early adversity and HPA-axis dysregulation in animals and in humans – especially in association with depression (Heim et al., 2008). Blunted secretion of diurnal cortisol – especially after awakening – has been observed in human and non-human primates with early trauma or loss. Fibromyalgia patients with childhood trauma showed a flattened cortisol after awakening response compared to patients without early trauma (Weissbecker, Floyd, Dedert, Salmon, & Sephton, 2006). Macaques, which were separated from their mothers between 3 and 6 months, had a lower cortisol secretion compared to peers who had received maternal care throughout their infancy (Sánchez et al., 2005). Blunted diurnal cortisol secretion has also been found in samples with other psychiatric and psychosomatic disorders: PTSD (Wessa, Rohleder, Kirschbaum, & Flor, 2006; Yehuda, 2006), burnout (Pruessner, Hellhammer, & Kirschbaum, 1999) and pain (Fabian et al., 2009). A strong suppression of cortisol secretion is considered to be a consequence of enhanced sensitivity of the pituitary gland to negative feedback subsequent to chronic high stress. Consequently, the homeostatic regulation of the stress response is compromised due to the dysfunctional HPA feedback mechanisms.

Subsequent research on HPA axis function in psychosis has shown two diverging trends: hypersecretion on static measures such as diurnal cortisol and hypo-secretion on dynamic measures such as Cortisol after Awakening Response (CAR). On reviewing cortisol studies in psychosis, Shah & Malla (2015) offered a new hypothesis for integrating the diverging strands of results (Shah & Malla, 2015). Authors suggest that the HPA axis is chronically hyper-activated by the stress experienced prior and during the onset leading it to eventually become exhausted. The HPA axis is weakened and has insufficient capacity to generate an appropriate response to acute stress leading to changes in dopamine release. Unfortunately, this comprehensive review did not consider the impact of early adverse

experiences in accounting for the variance seen in HPA axis data in psychosis. One study compared diurnal cortisol and CAR in first episode patients and in controls whilst controlling for childhood trauma, stress in past 6 months and current perceived stress (Mondelli et al., 2010). Hypersecretion of diurnal cortisol in patients (compared to healthy controls) was negatively related to amount of stress over past 6 months but unrelated to childhood trauma or perceived stress. Blunted CAR in patients compared to healthy controls was however associated with lower childhood sexual abuse. The latter finding in first-episode patients is at odds with our finding of blunted CAR being associated with increased levels of childhood trauma in chronic patients. Confounding factors such as duration of illness, smoking, sex, effects of long-term antipsychotic medication and co-morbid emotional disorders may all contribute to the diverging findings. Pruessner and colleagues found blunted CAR in FEP (vs. healthy controls) to be related to self-reports of non-optimal parenting in particular to parenting marked by affectionless control involving low care and high control (Pruessner, Vracotas, Joobar, Pruessner, & Malla, 2013). One study tested the traumagenic neurodevelopmental model by measuring the volume of limbic structures involved in HPA functioning using MRI. Self-reported childhood trauma significantly predicted left hippocampal volume in combination with age at onset of psychosis. Childhood trauma significantly predicted right and total amygdalar volume and total volume of hippocampal/amygdalar complex (Hoy et al., 2012). These studies all support the link between HPA axis dysfunction and early interpersonal adversity in people who later develop psychosis and point to the involvement of emotion regulation difficulties on a physiological level (Braehler et al., 2005; Hoy et al., 2012; Mondelli et al., 2010; Pruessner et al., 2013).

Thirteen years later, Read and colleagues revisited their hypothesis that “bad things happen and can drive you crazy”. Whilst few studies have explicitly tested the TNM except for Paper 2 and the studies reviewed above, much indirect evidence has accumulated to support the TNM (Read, Fosse, Moskowitz, & Perry, 2014). Early adversity in individuals with psychosis has also been associated with gray matter loss in prefrontal cortices, lowered



(left) hippocampal volume and increased sensitivity in the mesocorticolimbic-dopamine system. The association between childhood trauma, altered brain function and psychosis has been substantiated over the last decade thereby weakening long-held theories of genetic determinism. Childhood trauma remains a non-specific risk factor for all psychiatric disorders and greater severity and comorbidity of psychopathology (van Nierop et al., 2015).

Both psychological and biological studies on childhood trauma in psychosis point to affect dysregulation as a common mediating factor. What is the evidence linking childhood trauma, psychosis and affective dysregulation? The childhood trauma (often sexual abuse) – dissociation – positive symptoms (especially auditory hallucinations) – link has been replicated and might constitute one specific pathway of how early adversity can lead to psychosis (Bentall et al., 2014). Other research has investigated the correlates of childhood trauma in psychosis more broadly. Individuals with psychosis who have experienced childhood trauma show worse symptomatic, cognitive and functional outcomes compared to patients without (Read et al., 2014). When attempting to integrate results from these studies a more complex picture of potential mediating and moderating factors emerges. Large scale prospective studies have helped identify underlying psychological mechanisms.

Bebbington and colleagues (2011) demonstrated that the relationship between sexual abuse and psychosis was partially mediated by depression (Bebbington et al., 2011). This result ties in with a finding by Kramer et al. (Kramer et al., 2012). In a general population sample of 508 female twins authors observed that a genetic liability to depression moderated the relationship between childhood trauma and onset of psychotic-like experiences. Authors also tested the moderating impact of stress sensitivity operationalized as negative affect during experience sampling. Only depression and not stress sensitivity showed a moderating effect. Authors suggested that depression might be a precursor to psychosis whereas stress sensitivity might be a more distal factor preceding depression. A prospective longitudinal study by Fisher et al. (Fisher et al., 2013) further supported the link between childhood trauma, depression

and later onset of psychosis. Data from 6692 children and their mothers was collected on 1) children's exposure to harsh parenting, domestic violence in early childhood, 2) bullying victimization prior to 8.5 years, 3) anxiety, depression, self-esteem and locus of control in middle childhood, 4) psychotic symptoms in early adolescence. The association between harsh parenting and psychotic symptoms was fully mediated by anxiety, depressive symptoms, external locus of control, and low self-esteem. Bullying victimization and exposure to domestic violence had their associations with psychotic symptoms partially mediated by anxiety, depression, locus of control, and self-esteem. These findings lend support to the previously hypothesized cognitive and affective pathways (Freeman & Fowler, 2009; Myin-Germeys & van Os, 2007). The model offered by Freeman highlights the mediating role of emotional processes – in particular of threat processing and anxiety - in psychosis.

Affective dysregulation manifests both on a physiological and psychological level in people developing sub-clinical and clinical symptoms of psychosis and appears to be strongly related to early adversity.

### 3 Attachment and mentalization in psychosis

#### 3.a The development of emotion regulation in an attachment context

In order to develop psychological interventions, which strengthen emotion regulation in people with psychosis, we must take a closer look at how humans develop the capacity to effectively regulate their emotions.

From a biological perspective, humans – as all mammals – are highly dependent on parental care for their survival when they are born and for several years thereafter. Without the presence of a caregiver an infant is highly vulnerable to predators and unable to survive as he or she requires nutrition, shelter, protection, physical warmth, affection, verbal interactions and a sense of belonging from the outside to thrive. Infants are unable to soothe or contain their feelings of threat and distress. In early stages of development, the

caregiver soothes threat states in the child by activating his or her physiological care-giving/care-receiving system through physical warmth, affectionate touch, gentle vocalisations from the caregiver and affectionate caregiver-infant gaze. These vocal, visual and physical signals of social safeness calm the threat state inside the infant (Porges, 2007). The receiving of physical affection has been shown to be the predominant function of attachment bonds in early life – the lack of which has been shown to be detrimental to overall development (Harlow & Zimmermann, 1959).

From a psychological perspective, humans require the ability to infer mental states which underlie behaviour – to mentalize – to develop and maintain bonds with others and to navigate the social world. According to Fonagy and colleagues, internal working models of self and others need to contain a representational processing system that allows inferring of mind states of self and others including emotions, beliefs, intentions and desires to predict one's own and others' behaviour. The capacity to understand behaviour in terms of intentional states is thought to help to maintain bonds in our social groups, to regulate emotions and to experience a coherent sense of self (Fonagy et al., 2002). Modern attachment theorists have named the ability to infer one's own and others' mental states to predict behaviour mentalization or reflective function (RF) (Fonagy, Target, Steele, & Steele, 1998). For this internal interpretative capacity to develop, an infant needs a caregiver to attune to his needs, to respond in a sensitive manner, to mirror his feelings yet contain distressing affect through conveying positive affect. Through these contingent and reciprocal interactions an infant internalises the sense of existing as worthy of attention and care in the mind of another whilst experiencing a first sense of separateness of mental states between self and caregiver. The child experiences itself as an object with a mind state (e.g. distressed) distinct from the caregiver (e.g. calm) and as an object worthy of attention, care and soothing (e.g. through the loving calming presence of the caregiver) and develops trust in attachment figures (Fonagy, Gergely, Jurist, & Target, 2002). These early experiences of social safeness, affection and attuned contingent care influence brain maturation, in particular, of areas involved in social cognition and empathy (Schore, 1996) and lay the

foundation for emotional, social and intellectual development (Fonagy et al., 2002). The psychological self then develops both through adequate early mirroring and through the integrated representation of one's different mental states. During adolescence, as formal operational thought develops, bodies mature and peer relations become more important, maturation of mentalization is required to deal with the increasing cognitive, social and physical complexity of the young person's world. This gives rise to an adult-like psychological self which is ideally capable of integrating increasingly complex and potentially conflictual self-states into a coherent whole.

In summary, experiences of physical affection, social safeness and attuned contingent care through attachment figures in early years are critical for the development of adequate emotion regulation and social cognition in later years.

### 3.b Attachment and psychosis

Inadequate attachment experiences have been linked to difficulties forming relationships in adult life and to psychopathology (Bartholomew & Horowitz, 1991). Secure attachment on the other hand is an established protective factor (Sroufe, Carlson, Levy, & Egeland, 1999). If attachment experiences are critical for emotional regulation to develop, then what do we know about the relevance of attachment in people who later develop psychosis?

Read & Gumley (Read & Gumley, 2008) highlight that a majority of people diagnosed with psychosis not only suffered childhood trauma but also experienced their parents as being controlling while lacking in affection. When physical or more subtle emotional trauma occurs in the context of early attachment relationships, the child is deprived of the safe environment needed to develop capacities for integrating cognitive, affective and sensory aspects of experience into mental states, which can be used to regulate affect and to develop a coherent sense of self. Read, Liotti and Gumley (Liotti & Gumley, 2009; Read & Gumley, 2008) argue that insecure or disorganised attachment

is itself a dissociative process, which leads to an ongoing vulnerability to experiencing a fragmented self in the form of dissociative or psychotic symptoms.

A growing number of studies has observed high rates of insecure and disorganized attachment styles in people with psychosis since 2008 (Gumley, Braehler, & Macbeth, 2014). Two systematic reviews of attachment research in psychosis demonstrated that greater attachment insecurity is linked to more severe trauma, more avoidant coping, increased psychotic and affective symptomatology, more interpersonal problems and poorer engagement with mental health services (Gumley, Taylor, Schwannauer, & MacBeth, 2014; Korver-Nieberg, Berry, Meijer, & de Haan, 2014). Subsequently, Sitko and colleagues tested specific pathways between childhood trauma, attachment styles, depression and psychotic symptoms in a general population sample of 5877 individuals derived from the National Comorbidity Survey (Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood, 2014). Two main pathways emerged. Firstly, the link between sexual molestation and hallucinations was independent of attachment indirectly supporting the idea that dissociative mechanisms play an important role in explaining the sexual trauma – hallucination link (Varese et al., 2012). Secondly, the relationship between neglect and paranoia was fully mediated by both anxious and avoidant attachment strategies. Interestingly, when controlling for depression the link between neglect and paranoia was still fully explained by avoidant attachment. Authors conclude that attachment has a clear mediating role between adversity and psychosis that cannot simply be accounted for by comorbid emotional difficulties (Sitko et al., 2014).

Unfortunately, Sitko and colleagues were only able to test a three-way-model of attachment distinguishing between secure, anxious/ambivalent and avoidant attachment styles based on self-reports. The four-way-categorization of attachment includes a fearful disorganized category (Bartholomew & Horowitz, 1991), which is related to attachment trauma and dissociation (Liotti, 2004) and therefore relevant for explorations of trauma, attachment, dissociation and psychosis. Korver-Nieberg and colleagues recently

published data from 500 psychosis patients using the four-way-model. Seventy percent of patients demonstrated insecure or disorganized attachment: 24% avoidant, 18% fearful-disorganised and 11.5% anxious-preoccupied. Patients with fearful-disorganised attachment reported greater hallucinations, tension, anxiety and depression than patients with different attachment styles suggesting the greatest symptom load. Analysis of continuous scores revealed that attachment anxiety and avoidance were associated with greater positive and affective symptoms. Attachment avoidance was only related to emotional and social withdrawal but not to negative symptoms overall (Korver-Nieberg, Berry, Meijer, de Haan, & Ponizovsky, 2015).

Growing evidence seems to suggest that attachment insecurity or disorganization are highly prevalent in people with psychosis with avoidant and disorganized types being the most frequent. These results provide preliminary data that more individuals with psychosis hypo-regulate distress (by downregulating distress such as by means of dissociative coping and withdrawing from others) as opposed to hyper-regulate distress (eliciting care by showing and expressing distress) as postulated by Schwannauer & Gumley (Gumley & Schwannauer, 2006).

### 3.c Mentalization and recovery from psychosis (Paper 3)

When we feel socially threatened such as by being abandoned, humiliated or attacked, mentalization helps us to infer the motives of another in relation to us and vice versa in order to develop a differentiated understanding of the behaviour of ourselves and others in terms of mental states potentially buffering against feelings of hurt, shame or exclusion. If mentalizing is less developed, an individual might perceive hostile intentions as a concrete reality which they feel forced to take on or to turn away from if no other explanatory model is available. The experience of shame – existing as inferior or different in the mind of others (Gilbert & Andrews, 1998) – would be intensified and any distorted inferences about self or others reinforced.

Current consensus is that people with psychosis tend to demonstrate deficits in mental state understanding compared to controls across experimental paradigms (Sprong, Schothorst, Vos, Hox, & Van Engeland, 2007). These Theory of Mind deficits appear to be trait-like features which are present prior to onset and are largely independent of neurocognitive functioning (Bora, Yucel, & Pantelis, 2009). In a meta-analysis, out of all social and neurocognitive domains theory of mind impairments showed the strongest associations with functional outcomes such as community functioning (Fett et al., 2011). Caution must be exerted when examining research on mentalization in psychosis as studies vary greatly with regard to how they define and how they measure the concept. Some experimental paradigms assess mental state understanding by way of asking participants to recognise emotions in faces or to infer mental states from stories or to develop a coherent narrative out of random picture sequences or by self-report or analyzing discourse (see (Gumley, 2011) for summary). Whilst these paradigms offer a measure of impersonal cognitive perspective-taking they lack ecological validity when it comes to drawing conclusions about the utilization of mentalisation in personal and emotionally activating attachment contexts. Furthermore, studies on mentalisation in psychosis usually view the capacity as categorically present or absent and fail to test for its context-dependency.

Causes for compromised mentalizing are manifold and might include neurodevelopmental factors or iatrogenic illness effects. Rather than adopting a static view of the presence of absence of the capacity to mentalize, proponents of attachment theory propose that the capacities for mentalizing are especially enlisted in situations when the attachment system is activated such as when speaking about a loss of a loved one or personally meaningful experience, rejection by an attachment figure or similarly activating event. Depending on one's attachment style and mentalizing ability, mentalizing may be turned "on" (appropriately) or turned "off" by avoiding the topic or talking about mind states altogether or by offering distorted self-serving or other-blaming perspectives (Fonagy et al., 1998). Context-specific failures to mentalize can be viewed as strategies to protect oneself against painful affects

from earlier threatening interpersonal situations (Liotti & Gumley, 2009). High rates of social threat (van Os et al., 2010) and insecure attachment styles in individuals with psychosis certainly support this view (Gumley et al., 2014; Korver-Nieberg et al., 2015; Sitko et al., 2014) .

What do we know about individuals' capacity to mentalize about personally meaningful and possibly distressing experiences? In order to describe the style in which people process and talk about their psychotic experiences, McGlashan described a continuum of "recovery style" ranging from 'integration' to 'sealing over', which is measured by self-report (McGlashan, 1987). An integrative style is marked by flexible thinking, which allows some individuals to readily accommodate their illness experiences into their wider life context. A sealing over style involves treating the psychosis as separate from oneself and minimising its impact. Individuals with insecure attachment, more adverse early experiences and poorer self-image are more likely to adopt a sealing over recovery style. These patients are also less likely to engage with services, which makes them more susceptible to experiencing emotional dysfunction (Tait, Birchwood, & Trower, 2004). Avoiding processing the emotional impact following a first episode of psychosis has been linked to worse symptomatic outcome and reduced quality of life (Thompson, McGorry, & Harrigan, 2003). Based on these findings, theories have focused on the role of attachment style, affect regulation and mentalization in the emotional and interpersonal adaptation to psychosis (Gumley & Schwannauer, 2006).

An increasing number of authors propose to target attachment-related processes such as emotion regulation and mentalization in psychotherapy for psychosis to promote recovery (Brent, Holt, Keshavan, Seidman, & Fonagy, 2013; Harder, 2014; Korver-Nieberg et al., 2014) However, only two studies of attachment-based mentalization in psychosis have been conducted, One qualitative study presented below as Paper 3 (Braehler & Schwannauer, 2012); and one quantitative: (MacBeth, Gumley, Schwannauer, & Fisher, 2011). In keeping with attachment theory, an appropriate measure must assess



mentalization in the context of talking about emotionally salient close relationships and/or in times of emotional need. The Reflective Functioning (RF) scale (Fonagy et al., 1998) was developed to operationalize attachment-based mentalization when speaking about early attachment experiences during the Adult Attachment Interview (George, Kaplan, & Main, 1985).

Amongst 34 patients, Macbeth found RF scores to be heterogeneous but low on average, with the lowest scores being noted in those individuals with avoidant attachment. RF was unrelated to psychotic symptoms yet negatively related to quality of life suggesting that the better at mentalizing the worse patients perceived their quality of life to be. RF has found to be low in patients with borderline personality disorder (Fonagy et al., 1996), eating disorders (Skårderud, 2007), major depressive disorder (Fischer-Kern et al., 2013) and psychosis (MacBeth et al., 2011) whereas samples with higher-functioning patients with depression (Taubner, Kessler, Buchheim, Kächele, & Staun, 2011) or panic disorder (Rudden, Milrod, Target, Ackerman, & Graf, 2006) showed average to low levels of RF.

Lysaker developed an alternative narrative-based measure of metacognition in psychosis. The Metacognitive Assessment Scale (MAS) is used to assess the complexity of mental states of self and others when talking about one's experience of illness and recovery (Lysaker, Carcione., Dimaggio., Johannesen, Procacci, Semerari, 2005). Lower narrative-based metacognition has been shown to be linked to greater suspiciousness and emotional withdrawal and worse social (Lysaker, Carcione, Dimaggio, Johannesen, Nicolo, Procacci, Semerari, 2005) and vocational functioning (Lysaker et al., 2010) and greater NS (Macbeth 2014) in people diagnosed with schizophrenia.

In summary, research suggests that many individuals with psychosis appear to have experienced suboptimal early caregiving, which is associated with indicators of worse recovery following psychosis. Difficulties mentalizing in emotionally salient contexts is an indicator of emotion regulation difficulties resulting from early attachment relationships which can be targeted in

psychotherapy and potentially enhanced in constructive/ positive interpersonal contexts. Such difficulties have not yet been researched empirically in psychosis and their potential as an explicit target for psychological interventions needs to be explored.

### *3.c.i Aims & Methodology*

To explore processes of mentalization in relation to processes of adaptation to psychosis, 8 young people recovering from a psychosis were interviewed. First, the Adult Attachment Interview was conducted to rate the level of mentalization in an attachment context using the RF Scale on the transcript. Secondly, an open-ended grounded theory interview about the impact of the psychosis on their lives and processes of recovery was conducted. Four males, 4 females aged between 18 and 21 years who attended the local adolescent early psychosis support service participated.

### *3.c.ii Personal contribution:*

I designed the study, gained ethics approval, conducted all qualitative interviews and the majority of Adult Attachment Interviews, entered and analysed the data and wrote the manuscript. The study was conducted when working as a trainee clinical psychologist in the early psychosis service from 2006 to 2007.

### *3.c.iii Summary of paper:*

Two main themes relating to adaptation to psychosis and adolescent individuation emerged. Compromised RF was associated with unresolved adaptation and blocked individuation post-psychosis. Psychosis represented an “ambiguous loss” (Rando, 1984) of psychological integrity, self-confidence, motivation, hope, emotional well-being, autonomy, relationships and future aspirations. Akin to complicated grief reactions (Stroebe, Schut, & Stroebe, 2005), young people with compromised RF either ruminated over losses or continued to deny the emotional impact. Most remained disengaged from social or work life. Moderate RF was linked to primarily positive adjustment and successful individuation following psychosis. Young people with moderate RF were able to face up to a difficult adjustment process.

Avoidance, angry protest and gradual reappraisal eventually led to acceptance and reinvestment in life. They successfully embraced their vulnerabilities and prognostic uncertainty, which in some cases led to personal growth. All 8 young people showed corresponding levels of RF with regards to their states of mind about adaptation to psychosis and attachment relationships. Mentalizing ability in emotionally activating situations appears to make the young people more resilient in dealing with the impact of a first psychotic episode on their mental health, their friendships, vocational prospects and social roles. Strengthening a young person's capacity to compassionately relate to and to process the impact and to mentalize might promote recovery.

### 3.d Mapping mechanisms of emotion regulation in recovery from psychosis (Paper 4)

Research to date has exposed childhood trauma as a key risk factor for psychosis and more recently insecure or disorganized attachment as a potential mediating mechanism. In order to develop effective psychological interventions, we need to explore those phenomena in more detail. Research on early interpersonal experiences with caregivers has highlighted the salience of emotional abuse, affectionless control and neglect. Early interpersonal experiences with peers are typically marked by bullying, violence or discrimination. Interactions with society at large are often marked by social marginalization due to poverty, ethnic minority or migrant status. Individuals with psychosis experience social threat and social exclusion on many levels starting from the immediate family environment to larger society. Psychosis has been renamed a disorder of social adaptation in order to emphasize this particular pattern of findings (van Os et al., 2010).

Feeling excluded, threatened or looked down upon by the group we wish to belong to gives rise to shame. Shame can be defined as feeling as if one existed negatively in the minds of others, for instance by being viewed as unattractive, inferior or disgusting (Gilbert & Andrews, 1998). It involves a sense of vulnerability and inferiority that comes from experiencing ourselves as being shunned by others (external shame) and from evaluating ourselves in

a negative way (internal shame). Being shamed by an attachment figure such as by being called derogatory names, being bullied or humiliated (as seen in CTQ Emotional Abuse items “People in my family called me things like “stupid”, “lazy”, or “ugly”) has been shown to be particularly toxic to the development of a sense of self (Matos & Pinto-Gouveia, 2014). If we internalize a negative self-representation (“I am a bad/stupid/lazy/ugly person.”) and simultaneously lack the soothing, affection and support from another (“Others cannot be relied upon when I am in distress.”) then we likely develop avoidant or even disorganized internal working models attachment. At times of emotional distress, the individual will not have any sources of support or functional emotion regulation skills to revert to. Instead, the individual likely develops adaptive safety strategies aimed to ensure that he remains part of the group and avert any social rejection.

Safety strategies might involve experiential avoidance, social withdrawal (Flight) or preoccupation, hypervigilance, self-criticism (Fight) or subordination, compliance, appeasement (Subordination). Shame has been found to be a key predictor of depression (Kim, Thibodeau, & Jorgensen, 2011) and is associated with greater symptom load in a range of psychopathologies (Gilbert et al., 2010; Kelly & Carter, 2013).

Whilst all these experiences may contribute to the development of a psychosis, we were interested in understanding their impact on the maintenance of emotional difficulties following the onset of the psychosis. The aim of early intervention for psychosis has been to prevent relapse from occurring as more frequent relapses are associated with worse long-term outcome (Robinson et al., 1999). Research into post-psychotic emotional dysfunction suggested that those who felt unable to prevent relapse were more likely to develop depression (Birchwood, Mason, MacMillan, & Healy, 1993) and social anxiety (Gumley, O'Grady, Power, & Schwannauer, 2004). Depression in psychosis has been linked to increased suicidality (Birchwood, Iqbal, Chadwick, & Trower, 2000a, 2000b) which was mediated by feeling of entrapment, hopelessness, loss, marginalization and shame. Affected individuals typically feel trapped by an illness which is met with great

prognostic uncertainty and with few effective treatment options from mental health services and with unprecedented stigma from society. Individuals understandably feel marginalized, stigmatized and ashamed of their psychosis as they often also experience loss of friends, social status, jobs and actual rejection (Birchwood et al., 2007; Rooke & Birchwood, 1998) leading to social avoidance or social submission (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000). Social avoidance however cuts individuals off from others as a source of support, care and joy, which is needed to regulate those distressing emotions.

In 2008 colleagues and I first formulated ideas about how effective psychological interventions must improve the capacity to self-soothe and affiliate with kind others in order to re-establish a positive sense of self. These aims were in part supported by 1) Compassion Focused Therapy, which had been developed as a transdiagnostic and normalizing approach for complex shame disorders (Gilbert, 2009) and 2) by the recovery literature, which showed that what helped people to recover was to reestablish a sense of self as existing positive in the minds of others through one's personally meaningful contribution to society and by fostering group belonging and friendships.

#### *3.d.i Personal contribution:*

From 2008 to 2010, I acted as Chief Investigator and lead therapist on a funded feasibility trial of compassion-focused therapy for people with psychosis. The present theory paper emerged out of a close collaboration with one of the non-therapist co-investigators (first author) as I formulated the theoretical rationale for applying this novel approach to community patients with psychosis. We both contributed to the writing of the manuscript.

#### *3.d.ii Aims & Methodology*

In order to offer a novel reformulation of how problems with emotion regulation and interpersonal functioning can be understood through the framework of Compassion Focused Therapy, existing research was synthesized in order to develop hypotheses for further testing.

### 3.d.iii Summary of paper:

This is the first published model of how Compassion Focused Therapy can be applied to recovery after psychosis. In the first section, problems with affect regulation and interpersonal functioning commonly experienced by people recovering from psychosis are reviewed and embedded in attachment theory. Recovery after psychosis is hindered by the ongoing activation of internal and external threats including feelings of shame, stigma, entrapment, fear of recurrence and social isolation, which have been associated with increased rates of emotional dysfunction and reduced quality of life. In the second section, the paper offers a transdiagnostic and de-pathologising re-formulation of problems occurring during recovery as normal reactions to an overactive threat system by drawing on attachment theory, social mentality theory and neuroscientific insights into soothing and affiliation. The CFT model of emotional recovery from psychosis is illustrated in Figure 2 below.

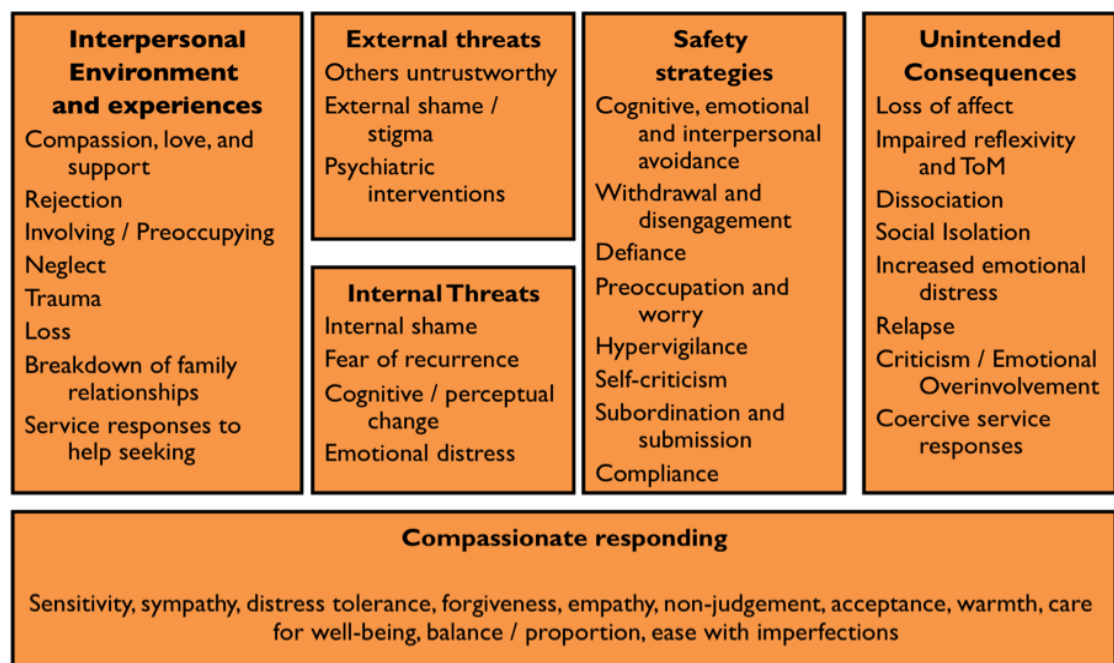


Figure 2. A compassion-focused formulation of threats experienced during adaptation following psychosis.

The model integrated the existing research findings at the time (up to 2009) into a model, which formulates further hypotheses about psychological mechanisms of recovery.

*Threat-based vulnerability factors:* Early experiences of threat and adversity in close attachment relationships, from peers or from wider society or through high rates of other psychosocial stressors are likely to sensitize individuals with psychosis to threat. Central to most findings is that most individuals with psychosis lack experiences of safety with others yet not having the opportunity to develop functional ways to self-soothe and related with kind and supportive others. Difficulties with processing and regulating social threat appear at the heart of problems.

*Threats experienced during adaptation:* Following a psychotic episode people experience major internal threats. Bullying voices, traumatic memories, low self-worth, shame and self-attacking (often tied up with delusional beliefs) maintain a high level of internal threat, conflict, distress and entrapment (Birchwood et al., 2000; Gilbert et al., 2001; Longe et al., 2010). The generation of voices is associated with voice hearers misidentifying critical internal signals/speech as critical external signals/speech (McGuire et al., 1996). This external attribution in turn increases threat and entrapment by reducing the sense of control individuals perceive to have over their mental state (Birchwood et al., 2000). The way in which the individual experiences the external world relating to them and to their psychotic experience determine the level of social threat. The trauma of the psychosis itself and its often devastating impact may further dysregulate affect (Gumley & Schwannauer, 2006). Relapses and being (re)traumatized by coercive service responses (Frame, 2001) pose actual threats, which can interfere with people's willingness to engage with services and to disclose distress.

*Safety strategies during adaptation:* Fears of being victimized, humiliated, stigmatized and excluded also foster submission, social withdrawal and isolation. A particular way of processing social threat is thought to contribute to paranoia and social anxiety. The combination of being at first hyper-vigilant of social threats followed by an active avoidance of the associated reactions effectively increases and exaggerates the perception of social threat (Green & Phillips, 2004). Shame and stigma are common in psychosis and

block affiliative connections to others, promote avoidance and increase social anxiety (Birchwood et al., 2006; Gilbert & Andrews, 1998). Avoidant coping strategies such as submitting to voices or to others by complying or appeasing (Birchwood et al., 2000), thought suppression (Fowler, 2006; Spinhoven & van der Does, 1999), avoidance (Udachina et al., 2009) or “sealing over” (McGlashan, 1987) are common and understandable attempts to cope.

*Unintended consequences during adaptation:* Unfortunately, sealing over strategies such as downregulating threats by minimizing the impact of the psychosis, being reluctant to talk about the psychosis or to explore its underlying emotional issues are linked to worse engagement (Tait, Birchwood, & Trower, 2003), difficulties with mentalizing (Braehler & Schwannauer, 2012) and worse outcome (Thompson et al., 2003). A lack of engagement with services is likely to be met with more coercive service responses and critical or overinvolving reactions from the family, more social isolation. Some people with psychosis might become fearful of others due to a heightened threat sensitivity and due to difficulties in affect recognition, mentalizing skills - rendering the “minds of others” strange and unfathomable (Penn, Corrigan, Bentall, Racenstein, & Newman, 1997; Russell et al., 2000). One can neither turn to others (for fear of being shamed and attacked) nor can one turn to an inner kindness because the sense of self is often experienced as fragmented due to derogatory voices or self-hatred. Threat exists both outside and within, with no source of soothing or support. Therefore, difficulties in regulating threat and soothing self and seeking support may increase distress, dissociation and collapse in mentalizing, in turn increasing the risk of relapse or even suicide.

In summary, the data suggest that people with psychosis suffer from major difficulties in regulating threat, which has since been corroborated in MRI and EEG studies (Corbera, Wexler, Ikezawa, & Bell, 2013; Mukherjee et al., 2012) and other experimental studies (Lincoln, Hartmann, Köther, & Moritz, 2014). For instance, higher stress sensitivity to an experimental noise was associated with a decreased awareness of emotions and ability to tolerate emotions in individuals with psychosis (Lincoln, Hartmann, Köther, &



Moritz, 2015). When comparing emotion regulation skills between psychosis, depressed and healthy samples, Lincoln found the two clinical samples to show similar difficulties with awareness, understanding and acceptance of negative emotions such as anger, shame, anxiety and sadness suggesting that these are valid targets for interventions (Lincoln et al., 2014).

Compassion Focused Therapy aims to regulate the threat system by activating the care-giving/care-receiving system as is done in early attachment relationships. The CFT model of emotion regulation and social mentality is put forward as informing service-level, family-level and individual interventions. The first author has since instigated and evaluated a compassion-focused integrated care pathway for early psychosis in an urban setting. In an individual setting, CFT aims to train techniques which help the individual to develop a sense of interpersonal safeness to relate to kind others to give and receive support as well as to self-soothe at time of distress. Experiences of social safeness, kindness and affiliation have been associated with the release of oxytocin and endorphins (Kirsch et al., 2005) and a decrease in adrenaline and cortisol (Heinrichs, 2003). I have since conducted a feasibility trial of CFT as a group therapy (see Paper 5).

### 3.e Discussion (Paper 3, Paper 4)

Findings of Paper 3 suggest that adaptation to psychosis in adolescence involves the double challenge of adjusting to a mental health crisis in the context of developing self-identity, building relationships with peers, separating from parents and striving for autonomy. More importantly, the qualitative data suggest that mentalization plays a key role in moderating adaptation on both levels. Most interestingly, the association between young people's ability to mentalize about their early attachment relationships and their life after psychosis suggests that how a young person reacts to psychosis seems to reflect their general ability to mentalize. Since this capacity developed in the context of early attachment relationships, impairments imply experiences of inadequate caregiving. This lends support to the idea that illness adaptation and development of self are parallel and interacting processes. Young people's stories suggest that positive adaptation to

psychosis is closely connected to a young person's ability to re-embark on their developmental trajectories. Psychosis often manifests in mid to late adolescence. The onset often impacts during a critical period for self-development, which often challenges the attachment system as the young person is confronted with decisions about adult life, with separation-individuation from their parents whilst having to negotiate and build new peer attachments. Re-establishing a stable sense of self is considered to be at the heart of recovery throughout the lifespan (Davidson & Strauss, 1992). Whilst we cannot change the early experiences individuals with psychosis had, an understanding of emotion regulation strategies can help clinicians find ways to promote adaptation and recovery from psychosis. If we combine insights from recovery research with findings on attachment and mentalization, it appears that what a person with psychosis might need is to develop a stable sense of self, which allows for both strengths and weaknesses to co-exist. Recovery research suggests that this can be achieved by people making personally meaningful contributions to society through work and through developing secure attachment relationships (Davidson & Strauss, 1992). Young people in this study revealed that stigmatising themselves as mad, isolating themselves, suppressing difficult emotions, avoiding to make sense of the psychosis, denying their losses, keeping their illness or hospitalisation a secret from their environment, being afraid of failure and putting themselves down blocked their recovery. What facilitated recovery were the ability to soothe and comfort oneself when feeling depressed, to have the courage to talk openly about one's illness experiences, to tolerate uncertainty, to try to make sense of the psychosis without blaming oneself or others and to have realistic and optimistic expectations about one's future. The capacity to tolerate, regulate and make sense of difficult emotions appears to have facilitated their recovery.

In summary, attachment findings suggest that young people might benefit from receiving kindness, support and acceptance from mental health staff, family and peers in order to experience others as a safe haven to turn to in times of need and a secure base from which to reengage with their lives. Furthermore, psychological interventions aimed at strengthening the capacity

to relate compassionately to the painful emotions of stigma, shame, loss and disappointment and to mentalize would help young people to integrate their experiences and make them more resilient.

What do the review of the literature and the findings of Paper 3 and the hypotheses offered in Paper 4 tell us about what factors promote emotional recovery?

Since the publication in 2010, findings from correlational, qualitative and experimental studies have provided additional support for a compassion focused model of recovery after psychosis (Gumley, Braehler, Laithwaite, MacBeth, & Gilbert, 2010) and the use of CFT for psychosis. Shame was found to predict greater post-psychotic emotional dysfunction in the form of trauma, depression (Turner, Bernard, Birchwood, Jackson, & Jones, 2013) and social anxiety (Michail & Birchwood, 2014). Attacking oneself in a hateful way is thought to be a safety strategy that reduces feelings of shame. Hateful self-attacking was more common in people with persecutory delusions than in healthy controls (Hutton, Kelly, Lowens, Taylor, & Tai, 2012). Early memories of threat, shame and submissiveness predicted paranoid symptoms in a general population sample through their direct impact on external shame and indirect impact on internal shame and submissive behaviour (Pinto-Gouveia, Matos, Castilho, & Xavier, 2013). The traumatic impact of early shame memories and the centrality to the person's identity was found to be strongly related to paranoid anxiety (Pinto - Gouveia, Castilho, Matos, & Xavier, 2013). Relationships with voices can mirror dominant-subordinate dynamics in real relationships (Birchwood et al., 2004) and whilst often controlling and shaming, they can also meet an affiliative need. The voice hearer's capacity to self-reassure following critical thoughts exerted influence on the voice's shaming content heard (Connor & Birchwood, 2013). The latter finding suggests that voice content could become less threatening if the person learns to reassure their self-critical thoughts. Following induction of personal distress, compassion focused imagery was associated with greater reductions in subclinical paranoia by

reducing negative affect compared to a neutral image (Lincoln, Hohenhaus, & Hartmann, 2012).

We can conclude that interventions aimed at improving affect regulation in psychosis need to target the following processes: (1) stress sensitivity; (2) dysfunctional intrapersonal and interpersonal emotion regulation (3) shame, self-attacking and subordination; and (4) failures in mentalizing. Compassion Focused Therapy (CFT) aims to address 1)-3) by downregulating an overactive threat system and a dominant-subordinate mentality including shame, self-attacking, resulting distress and defeat by stimulating the caregiving/-receiving mentality, which gives rise to affiliative and soothing feelings, thoughts, behaviours and more flexible approach/avoidance behaviour (Gilbert, 2010). The first aim of CFT is to establish social safeness and trust, which is critical for mental health (Kelly, Zuroff, Leybman, & Gilbert, 2012) and thought to be the foundation for 4) mentalizing to develop (Liotti & Gilbert, 2011).

Gilbert defines compassion as developing out of our innate caregiving/-receiving mentality and other attributes such as a sensitivity to suffering, an emotional resonance with suffering, distress tolerance to hold suffering, cognitive empathy to maintain boundaries between self and other and a non-judgmental attitude towards the suffering (Gilbert, 2009). CFT for psychosis therefore aims to (1) increase trust and social safeness, to gradually overcome fears of affiliative relating and 2) to learn to relate to one's own distress and to others in a compassionate way and 3) to increase mentalizing in relation to the impact of the psychosis from a caregiving/receiving mentality (Braehler, Harper, & Gilbert, 2013).

#### 4 Compassion Focused Therapy for promoting emotional recovery

##### 4.a Cognitive Behaviour Therapy for psychosis: effectiveness for emotional outcomes

Cognitive Behaviour Therapy (CBT) for psychosis is to date the most researched psychological intervention for people suffering from psychosis and the psychological therapy of choice as per national treatment guidelines. However, what is the effectiveness of psychological interventions for emotional outcomes?

The first wave of CBT for psychosis (CBTp) protocols and studies aimed at reducing positive symptoms using generic CBT. Meta-analyses demonstrated that first wave CBTp trials showed consistent small to moderate effects on positive symptoms, which were comparable to effect sizes of antipsychotic medication thereby offering a more humane, safer and empowering treatment alternative. Indeed, a trial of CBT vs. TAU of individuals not taking antipsychotic medications showed CBT to be associated with significantly greater reductions in symptoms than TAU suggesting that CBT alone may be an effective and safe treatment (Morrison et al., 2014).

The second wave of CBTp was inspired by Max Birchwood's suggestion not to view CBTp as a quasi-neuroleptic that would reduce positive symptoms but to address truly relevant outcomes (such as distress, compliance with voices, social functioning, quality of life) by testing specific models through targeted interventions: *"The way forward is to abandon the neuroleptic metaphor of CBT for psychosis and to develop targeted interventions that are informed by the growing understanding of the interface between emotion and psychosis."* (Birchwood & Trower, 2006).

Unfortunately, effects of CBTp on key aspects of emotional recovery such as depression or hopelessness were negligible in the first meta-analysis of CBTp

(Wykes, Steel, Everitt, & Tarrier, 2008). A more recent meta-analysis found smaller effect sizes for positive symptoms ranging from 0.08 to 0.15 and failed to report effects on emotional outcomes (Jauhar et al., 2014). The meta-analysis was heavily criticised as authors had used end-of-study-data of psychotic symptoms thereby missing the common effect of CBT on reducing distress and improving quality of life in the longer term rather than reducing psychotic symptoms per se (Birchwood, Shiers, & Smith, 2014).

The second wave of CBTp trials has indeed based their designs on specific interventions and outcomes. Updated models of cognitive-emotional processing have developed targeted interventions to reduce worry in people with delusions (Freeman et al., 2014) and to reduce compliance with command hallucinations (Birchwood, Michail, et al., 2014) yielding both successful results on their respective target outcome (worry, compliance with command hallucinations). Generic mindfulness and acceptance-based models have been applied to reduce rumination and identification with voices (Bach & Hayes, 2002; Chadwick, Hughes, Russell, Russell, & Dagnan, 2009). Generic positive emotion approaches have been used to enhance coping (Tarrier, 2010).

The active ingredients of helpful psychological intervention in psychosis are not yet fully understood. An MRI study showed changes in threat processing following CBT (Kumari et al., 2011). Qualitative studies of CBT in psychosis suggest that understanding psychosis and learning new ways to cope with distress and symptoms is experienced as helpful (Berry & Hayward, 2011). CBT and befriending were equally effective in reducing relapse in an RCT for first episode patients (Jackson et al., 2008) suggesting that the so called non-specific therapeutic factors of respect, warmth, human connection, acceptance and compassion may contribute significantly to outcome in addition to specific techniques aimed at strengthening emotion regulation in order to reduce stress sensitivity and difficulties regulating social threat and to improve mentalizing.

#### 4.b Developing an attachment-informed and compassion-

### focused protocol

In 2008 I developed a CFT group protocol, which has been published in a chapter in a book on CBT for schizophrenia (Braehler, Harper, et al., 2013). The therapeutic process and techniques in CFT are based largely on CBT but draw also on imagery, mindfulness-based, emotion-focused and bodyoriented therapies (Gilbert, 2010). Gilbert originally developed CFT for complex shame disorders such as severe depression or complex trauma, whose distress is maintained by persecutory self-hatred and self-attacking and who did not benefit from cognitive restructuring. By accessing their inner care-giving/care-receiving systems through different modalities (voice tone, imagery, body posture) patients develop a kinder and more supportive self-to-self relationship – their compassionate self – and ultimately improve their relationships with others.

In the case of recovery from psychosis, CFT is applied more widely as a resource to counteract all external and internal threats experienced. A compassion-focused formulation of recovery stresses the adverse emotional and interpersonal consequences that psychotic experiences typically have on a person's life (Gumley et al., 2010). At the heart of group CFT for psychosis (CFTgp) is the development of compassionate relating to threats experienced in psychosis. Emotional resilience is developed through the gradual desensitization to self-compassion using psychoeducation, mindfulness and compassion practices, reframing, interpersonal learning, building of peer attachments and narrative tasks. Recommendations for interpersonal group therapy in psychosis (Kanas, 1996; Yalom, 1983) and aspects of mindfulness training (Nairn, 1999; Segal, Williams, & Teasdale, 2002) were also taken into account.

Following a thorough psychological assessment, engagement in CFT happens throughout by focusing away from the psychosis onto its adverse impacts and by repeatedly validating clients' coping strategies as their best effort to deal with difficult situations. In CFT therapists explicitly adopt a therapeutic stance of common humanity such as by talking about "our tricky brains" and unintended consequences not being "our fault". Although members might

vary with regards to their illness models, CFT fosters mutual respect of different ways of making sense by focusing members' attention on their joint goal, their common emotional difficulties and the universality of emotional suffering. The full protocol can be found in the appendix.

In order to describe how group-based CFT is informed by attachment theory and aims to strengthen the care-giving/care-receiving system, I have outlined below how safe haven and secure base are developed in the specific interventions. Safe haven refers to the experience of the attachment figure as a haven for the expression and resolution of distress and pain, whereas secure base refers to the role of the attachment figure in promoting the confidence for autonomy, exploration, and curiosity. The interaction between safe haven and secure base behaviours along with proximity seeking provide the basis of the development of infant attachment security.

Developing safe haven: In a group format 'the group' becomes a first source for safe haven by providing a safe social context of sharing common fears and experiences where they are not being shamed. Fears of affiliation are mapped out and normalised through psycho-education. Group members' sense of isolation and marginalisation reduces as they recognise each other as peers who share difficult experiences. Trust facilitates bonding and cohesion. Individuals can recognise their own fears, shame and vulnerabilities in real others helping them to "feel felt" and safe enough to begin to engage with others non-verbally and verbally. Interpersonal safeness increases through experiencing real *others* as vulnerable yet benevolent and understanding and experiencing *oneself* as capable of existing positively in the minds of others. Experiencing others as benevolent and supportive activates the desire to help. These mutual interactions help open the affiliative systems including the capacity to mentalize and they stimulate a movement towards compassion. Developing a joint compassionate group mind (e.g. a poster of statements present in the group) that can be consulted during difficulties can also act as a concrete scaffold towards developing and internalising a compassionate mind.



Expressing and receiving validation for common experiences of distress within the warm and friendly atmosphere of the group provides a first safe external ground from which to develop intrapersonal safeness through guided teaching of self-soothing skills. The development of the safe external ground is thought to facilitate the development of safe internal ground and vice versa, so that the core self and the capacity for regulation threat is increased. This might involve imagining an ideal compassionate other, which can act as a secure internal representation of a care-giving mind. These practices are used as stepping stones toward developing a compassionate self (Gilbert, 2010). The felt sense of a compassionate self is gradually generated through breathing techniques, postures practicing developing compassionate and kind inner voice tones, imagery practices. Group members practice thinking and acting from this compassionate self. The compassionate self then becomes an intrapersonal safe haven and secure base. From this growing safe haven, fear of affiliation can be clarified and safely tested out. Individuals who are afraid to receive kindness from others, for instance, because they fear others might take advantage of them, might revise this fear through observing how others in the group try to support each other in respectful and sensitive ways. Being experienced as helpful to others can be another safe way to interact with others compassionately.

Engaging secure base: Once the safe haven has been established sufficiently for a sense of affiliation and safeness to regulate threat states, secure base behaviours are encouraged at each person's individual pace. To counter experiential avoidance, members are encouraged to tune into and explore their own sensations, feelings and thoughts through basic awareness exercises. This can strengthen body awareness and emotion recognition and reduce fear of emotions. Sharing and inquiring into those inner experiences help members develop an attitude of curiosity and playfulness as opposed to threat. This attitude as embodied through the compassionate-self practice is the basis for the exploration for one's own mind and those others both within and outside the group. The safe haven then becomes the secure base from which to empathically engage with and explore potentially painful mental states of self and others. The growing affiliative competences and reduced avoidance are thought to provide a context within which social cognition,

reflexivity and mentalisation can develop and unfold, so that even painful mental states can be integrated and more assertive rather than submissive interpersonal strategies can be rehearsed.

#### 4.c Feasibility trial of Group Compassion-Focused Therapy for Recovery after Psychosis

At the time of conceiving psychotherapeutic interventions in 2008 and 2009, only preliminary data from two case studies (Johnson et al., 2009; Mayhew & Gilbert, 2008) and one uncontrolled evaluation (Laithwaite et al., 2009) were available indicating mixed but promising results.

In a first attempt to address these questions Mayhew and Gilbert (Mayhew & Gilbert, 2008) used a single case design with three individuals who heard distressing malevolent voices, but who were not actively psychotic. Following 12 individual sessions of CFT, two did very well and one less so. The clients who significantly improved found the compassion focus a new way of relating to themselves and others. The individual who did less well felt he “didn't deserve compassion” and was dominated by intrusive fantasies which he felt too ashamed to discuss. This is not an uncommon problem and speaks to the complex relationship between self-compassion and shame (Gilbert, 2010).

Johnson and colleagues explored the effects of a specific compassion practice - Loving Kindness Meditation – in 3 outpatients with persistent negative symptoms. Whilst some patients reported improvements in sense of social connectedness and motivation, others struggled to concentrate on the meditation (Johnson et al., 2009).

In a study of 20 sessions of group CFT for 19 clients with psychosis in a high security psychiatric setting, Laithwaite and colleagues (Laithwaite et al., 2009) found a large magnitude of change for levels of depression and self-esteem. In addition moderate effects were found for social comparison and general psychopathology, with a small magnitude of change for feelings of shame. These changes were maintained at 6-week follow-up.

All these preliminary studies lacked a coherent theoretical model that would have provided a rationale for how to adapt compassion-focused interventions to working with people with psychosis. Except for Johnson who aimed to reduce negative symptoms by “broadening and building” the antidote of positive affect, studies lacked a specific target outcome. Interventions varied in their format from brief mind training, manualized group therapy and open-ended exploratory individual therapy making it difficult to compare. No control groups were used. To improve on the existing studies, we designed a feasibility controlled trial of manualized group-based CFT which was developed for the needs and abilities of community patients recovering from psychosis and built on our treatment rationale (Gumley et al., 2010).

Correlational studies in non-clinical samples showed that self-compassion was associated consistently with various indicators of positive psychological and physiological health (Neff, Kirkpatrick, & Rude, 2007). At that point, no RCT of self-compassion or compassion-based interventions in either clinical or non-clinical populations had been reported.

#### *4.c.i Aims & Methodology*

The study aimed to assess the feasibility of randomization, safety, acceptability of CFT and signals of change processes associated with CFT in a community setting using a parallel group design with blinded evaluation. A prospective, randomized, open-label, blinded end point evaluation clinical trial was conducted to compare group CFT plus treatment as usual (TAU) with TAU alone. Following baseline assessment, 40 community patients were randomly assigned to the two conditions. Group CFT consisted of 16 sessions delivered over 4 to 5 months by two trained clinical psychologists. Participants were assessed posttreatment/post-wait. Waiting lists also received group CFT but these data could not be included in the study. Assessments included the Clinical Global Impression Scale, narrative-based measures of compassion and avoidance, self-reports of depression, personal beliefs about illness, fear of recurrence and positive and negative affect.

#### *4.c.ii Personal contribution:*

As Chief Investigator of a funded study to investigate compassion-focused therapy for people with psychosis I was involved in all stages of project management from study design, grant application, ethics approval, R&D approval, recruitment, clinical protocol development, clinical supervision of co-therapists, delivering therapy, supervision of research assistant, data analyses and writing up of manuscript.

#### *4.c.iii Summary of paper:*

Group CFT was associated with no adverse events, low attrition (18%), and high acceptability. Relative to TAU, CFT was associated with greater observed clinical improvement ( $p < 0.001$ ) and significant increases in compassion ( $p = 0.015$ ) of large magnitude. Relative to TAU, increases in compassion in the CFT group were significantly associated with reductions in depression ( $p = 0.001$ ) and in perceived social marginalization ( $p = 0.002$ ). Within the CFT group only, increases in compassion were significantly associated with shame and fear of recurrence; reductions in avoidance were significantly associated with increases in compassion. However, these correlations were not significantly stronger than the correlations in the TAU group. Figure 3 illustrates the correlations between changes in compassion and other measures in CFT and TAU. The evidence, albeit limited at this stage, suggests that CFT is safe and acceptable to use with this population.

## Compassion as a change process



Figure 3. Pearson's correlations between compassion median change and mean change on BDI - Beck Depression Inventory; PANAS NA - Positive and Negative Affect Scale- Negative Affect, PANAS PA – Positive and Negative Affect Scale – Positive Affect, PBIQ- Personal Beliefs about Illness Questionnaire, ForSE – Fear of Recurrence Scale in CFT and TAU.

### 4.d Oxytocin, attachment and compassion in recovery from psychosis (Paper 6)

Oxytocin is a neuropeptide involved in emotion regulation, social affiliation and attachment and social cognition, all of which appear to be potential targets for interventions in psychosis. Researchers subsequently tested synthetic oxytocin as a novel treatment paradigm for psychosis in particular with view to improving social cognition. A systematic review of oxytocin in schizophrenia (MacDonald & Feifel, 2012) concluded that the literature strongly supported its promise as a novel treatment for schizophrenia. One important caveat proposed in this review was the need for future research

exploring the context-dependent effects of oxytocin (Bartz, Zaki, Bolger, & Ochsner, 2011). Context dependency is important in schizophrenia. If we wish to stimulate affiliative behaviour through improving social cognition, one important aspect of context dependency are the life experiences of individuals diagnosed with schizophrenia and how individuals adapted to these. Evidence for this sort of context dependency comes from Rockliff and colleagues (Rockliff et al., 2011) who studied the impact of oxytocin on compassionate imagery in a general population sample. Some of the self-critical participants experienced the oxytocin negatively partly because it made them sad and focus on their lack of close relationships. In a review of the literature exploring the social effects of oxytocin, Bartz and colleagues concluded that generally (across different populations) the effects of oxytocin were often weak and/or inconsistent and that the effects of oxytocin were constrained by contextual or individual differences. For example, oxytocin was linked to prosocial behaviours in some studies (e.g., increasing trust, attractiveness, and attachment) and the opposite in other studies (e.g., greater envy, mistrust, derogation of others, and attachment insecurity). These inconsistencies amplify the importance of understanding the effects of oxytocin in an interpersonal context where the effects of oxytocin are moderated by characteristics of the population being studied (e.g., borderline personality disorder (Bartz et al., 2010)), the cooperative/competitive context of the experimental task (e.g. De Dreu et al., 2010), and the familiarity/trustworthiness of the other person (e.g. Declerck, Boone, & Kiyonari, 2010). Bartz and colleagues (Bartz et al., 2011) proposed an interactionalist understanding of the social effects of oxytocin in humans where the impact is moderated by features of the social environment (degree of situational threat/competitiveness) or individual differences (e.g., attachment security, social anxiety). For example, increasing attention to social cues through oxytocin could be detrimental to individuals who are hypersensitive to interpersonal threat or who have insecure or disorganised attachment experiences.

#### *4.d.i Aims & Methodology*

Evidence from animal studies indicates proof of concept of oxytocin as an antipsychotic treatment for schizophrenia. As treatment trials of oxytocin in human clinical samples increase, we conducted an exploratory meta-analysis to estimate an effect size for oxytocin treatment on psychotic symptoms and on social cognition. We hypothesized that oxytocin would be associated with lower levels of psychotic symptoms and increased social cognition compared with placebo.

We conducted a systematic search of electronic databases from 1980 and November 2013 for randomized controlled trials (RCT's) of oxytocin in schizophrenia. Participants had a diagnosis of Schizophrenia or psychosis and the outcome variables explored the effects of oxytocin in relation to symptom outcomes or social cognition. Preclinical studies of oxytocin and schizophrenia, unpublished studies, dissertations, conference abstracts and book chapters were excluded. Effect sizes for oxytocin on symptoms were extracted and converted to Hedge's 'g'. Symptom scores were reported on the PANSS scale or converted to PANSS equivalence. Meta-analyses were conducted with both fixed and random effects meta-analyses, incorporating assessment of heterogeneity, publication bias and influence bias.

#### *4.d.ii Personal contribution*

Together with the first author I developed the rationale for the meta-analysis and critique by reviewing the literature and describing updated hypotheses about processes of social cognition and attachment involved in recovery from psychosis. I wrote the manuscript together with the first author. The third author helped with the statistical calculation of effect sizes and edited the manuscript accordingly.

#### *4.d.iii Summary of paper:*

This review paper explored the effects of oxytocin as novel treatment option for reducing symptoms and improving social cognition. There were seven randomized controlled trials that met the inclusion criteria for this review. We conducted an exploratory meta-analysis of data from four of these studies on a total sample size of  $n = 105$ . For overall symptoms, using a random-effects-

model oxytocin versus placebo was associated with an effect size of  $d = 0.52$  (95% CI = 0.34–0.70;  $z = 5.66$ ;  $p < .01$ ). There was evidence of significant heterogeneity ( $Q = 96.4$ ,  $p < .001$ ;  $I^2 = 96.5\%$ ). Similar patterns of findings were observed for positive, negative, and general symptoms. We found significant evidence of high risk of bias across all studies. We also identified that one particular study had an undue effect on overall effect size estimates. Finally, evidence linking oxytocin to improved social cognition was inconsistent. There are significant problems in interpreting the current evidence base for oxytocin in psychosis. However, oxytocin may provide a useful biomarker for exploring mechanisms of change occurring in psychological therapies including compassion-focused therapy (CFT), which through its engagement of the attachment system may directly influence oxytocin.

#### 4.e Discussion (Paper 5, 6)

Paper 5 was and is to date the first and only randomized controlled evaluation of CFT in general and of a compassion-based intervention for a clinical population. The study clearly demonstrated the high degree of safety and acceptability of CFT for people with psychosis. The high rate of global clinical improvement (65%) compared to TAU (5%) at follow-up also supports the overall objective clinical benefits of this medium-term group intervention. The analysis of narratives revealed a significant increase of large magnitude in compassion (0.59) at the end of treatment in the way CFT participants talked about their psychosis and their recovery compared to a non-significant increase of small magnitude in TAU (0.29). These increases in compassion were significantly correlated with reductions in depression, negative beliefs about psychosis, and fear of relapse in the CFT group. The CFT group showed the strongest associations between an increase in compassion and a reduction in depression and social marginalization of moderate magnitude. These associations were significantly greater than the respective correlations in the TAU group. These findings highlight the important mechanisms of change linked to CFT. This could be viewed as initial evidence that the development of affiliation to self and others reduces



clients' sense of exclusion and inferiority/shame due to their illness and related depressed affect.

A great number of correlational, experimental and uncontrolled evaluations of self-compassion and derived clinical and non-clinical interventions have since been published. Responding to one's distress in an attuned, connected and kind way – self-compassion – has since been found to be associated with reduced psychopathology in a meta-analysis (MacBeth & Gumley, 2012), with more positive emotions (Neff & Germer, 2012) and greater resilience in the face of serious adversity (Pinto - Gouveia, Duarte, Matos, & Fráguas, 2013). Following compassion training in non-clinical populations physiological and neural threat responses were reliably reduced (including cortisol) and physiological responses of safeness and soothing increased (oxytocin, heart rate variability) (Desbordes et al., 2012; Kok & Fredrickson, 2010; Pace et al., 2009; Rockliff, Gilbert, McEwan, Lightman, & Glover, 2008). Brief compassion training also reduced emotional distress associated with emotional empathy by activating positive affect of love (Klimecki, Leiberg, Ricard, & Singer, 2013). Compassion training has also been shown to increase facial recognition of affect (Mascaro, Rilling, Negi, & Raison, 2012). Preliminary evidence suggests that CFT is safe to use with people with different psychiatric groups (Gale, Gilbert, Read, & Goss, 2014; P. Gilbert & Procter, 2006; Lucre & Corten, 2012) including psychosis (Braehler, Gumley, et al., 2013; Laithwaite et al., 2009; Mayhew & Gilbert, 2008).

In the same way as CFT is hoping to stimulate the care-giving/care-receiving system and associated oxytonergic and dopaminergic systems in a gradual and controlled manner, intranasal oxytocin has been put forward as a novel and quick treatment to reduce psychotic symptoms and to increase social cognition (MacDonald & Feifel, 2012). Paper 6 carefully reviews all randomised controlled trials published until 2013 with regard to their effect sizes on positive symptoms and social cognition in psychosis. Although there is evidence for a positive effect of oxytocin on symptoms there are several obstacles in interpreting the evidence base available at the time. The small

number of published studies hinders assessment of follow-up length or oxytocin dosage. We noted that 8 further studies are ongoing or just completed. Treatment effects appeared stronger for within-group pre-post treatment gain, compared with group comparison with placebo. Recent evidence also suggests that positive oxytocin effects may be lowered in the presence of negative childhood experiences, suggesting potential environmental modulation of oxytonergic systems especially in individuals with borderline personality disorder (Ebert et al., 2013). In contrast to the author's hypotheses, males with depression experienced increased anxiety during a therapeutic session after receiving intranasal oxytocin (MacDonald et al., 2013). Taken together, the effects of synthetic oxytocin on an adult human being with lived attachment experiences are highly divergent and seemingly dependent on shaping of the attachment system due to life experiences and on whether the situation context evokes trust or threat.

Therefore, following on from Bartz and colleagues (Bartz et al., 2011), we propose that individuals' attachment provides an important context in which to develop an interactionalist understanding of the role of oxytocin in individuals diagnosed with schizophrenia. In a systematic review, insecure attachment was associated with more negative parental representations, and greater experience of trauma, more severe psychiatric symptoms, disengagement, problems in seeking help, poor use of treatment, longer hospital admissions, lower rated therapeutic alliance, and lack of acceptance and awareness of emotions (Gumley et al., 2014). Attachment behaviours are underpinned by the interaction of the dopaminergic reward processing system (Strathearn, Fonagy, Amico, & Montague, 2009) and the oxytocinergic system (Bartels & Zeki, 2004) – the very systems, which are implicated in understanding schizophrenia (Rosenfeld, Lieberman, & Jarskog, 2010). Competences for affect regulation and social cognition, require the context of secure attachment and felt safeness to emerge and develop (Fonagy, Gergely, & Target, 2007). Oxytocin is thought to enhance social approach and attachment behaviour by increasing gaze to the eye region, which in turn is associated with improved social cognition necessary for interpersonal communication (Chung, Barch, & Strube, 2014). Individuals with

schizophrenia have been found to have difficulties recognizing facial emotions – in particular fear and anger – because they avoid making eye contact (Kohler, Walker, Martin, Healey, & Moberg, 2009). Difficulties in recognizing fear have been linked to hyperactivity in the amygdala, indicative of stress, and with greater negative symptoms (Morris, Weickert, & Loughland, 2009). Administering oxytocin to healthy participants can increase gaze to the eye region of neutral faces (Guastella, Mitchell, & Dadds, 2008) and can reduce amygdala activation for threatening faces (Kirsch et al., 2005). Interestingly, individuals with schizophrenia perform at a level comparable with healthy controls on facial emotional recognition when they are provided with a situational context (Lee et al., 2013), suggesting that this deficit might be dynamic and context dependent.

In summary, many individuals with psychosis experience states of heightened social anxiety and depression, a sense of vulnerability to more powerful others, alongside an activation of subordinate and defeat states, all of which produce social avoidance and efforts to disengage from others rather than engage. Affiliative behaviour, in particular caring relationships, is subsequently more likely to be avoided. Being unable to use others as sources of soothing and safeness, which can downregulate threat, creates serious problems in the development of social cognition. For example, developing mentalizing abilities requires individuals to feel safe enough in close proximity that they can interact and make sense of the interactions, by making sense of facial expressions voice tones and gestures. The lack of (felt) interpersonal safeness and overt hostility in the context of attachment or potentially affiliative relationships interferes with the development of mentalization because individuals are cutting off from these very signals necessary for the development of mentalization. For example, if an individual submits by withdrawing, they cannot experience the calming social signals that convey a sense of existing safely and positively in the mind of the other, leaving the individual more prone to internalizing hostile or rejecting mind states from others. Closeness with others might have low hedonic value and/or trigger threat emotions resulting in limited opportunities for understanding, soothing, and exploring one's own mind states and those of others.

Our findings regarding the relationship between oxytocin and symptom expression and social cognition in people diagnosed with schizophrenia provide an opportunity to consider the possibility that the attachment system is implicated in the pattern of symptoms and social-cognition impairments that characterize and define what we call schizophrenia. Arguably this may occur as a consequence of illness or alternatively might provide insight into a pathway into schizophrenia that is marked by early interpersonal and social adversity (van Os et al., 2010). Based on this perspective, future research exploring oxytocin in schizophrenia should consider the interpersonal and attachment context of individuals participating. Due to the increase in divergent findings in oxytocin studies, there has been an increase in the discussion of individual differences and the influence of situational contexts in the oxytocin literature in general. One major misunderstanding seems to have been that researchers believed oxytocin to *directly* lead to improvements in trust, empathy, approach and reductions in anxiety whereas intranasal oxytocin appears to simply open the already developed attachment system and activate the emotional memories associated with care-giving/care-receiving. Anxiety might be activated in an anxiously attached individual whereas anger might be activated in an abused and avoidantly attached individual. Oxytocin appears to be involved in the developing of the neural substrate of attachment early in life (Feldman, Gordon, Influx, Gutbir, & Ebstein, 2013). The activation of trust, empathy, emotion regulation and social cognition seem to be mediated by a more comprehensive system of neuropeptides and hormones, which is as yet insufficiently understood.

## 5. Limitations & Future Research

The following chapter discusses the key theoretical, methodological and statistical limitations of Paper 1 to 6 in turn, whilst putting forward ideas for how future studies could overcome these limitations.

Paper 1 suffered from several limitations.

Firstly, at the time of the design of the study few studies on the topic were available. The hypothesis that emotional and physical abuse would

have particularly strong associations with dissociation was therefore based on pilot findings obtained by the same research group (Holowka et al., 2003). Research published over the past 10 years has provided robust evidence for a clear link between sexual abuse and auditory hallucinations suggestive of a direct trauma-dissociation-based pathway to voices (Varese et al., 2012). In the light of these findings, our hypotheses should have been reviewed. Partly in keeping with this body of research we found the greatest amount of variance in dissociation to be explained by emotional and sexual abuse.

Secondly, rates of childhood trauma in the community controls (43.9% at least one moderate childhood trauma) were not significantly different to those observed in patient groups (53.5% chronic, 50.8% first-episode). Rates in the general population range from 17 to 32% (Briere & Elliott, 2003). The elevated psychiatric morbidity in community controls (34.8%) compared to other studies (e.g. 23.3% in NEMESIS study, Bijl 1998) might account for this finding. Community controls had been recruited as part of a study investigating anomalous experiences in the general population. This may have biased the sample in that it attracted individuals who identified themselves as having had such experiences including those anomalous experiences which overlap with clinically significant symptoms. The sample was therefore not fully representative of the general population but skewed towards greater psychiatric morbidity. Future studies might want to exclude individuals with any psychiatric morbidity to obtain a truly healthy control group.

The cross-sectional design precludes any statements about causality. Key variables were measured by self-report as opposed to a more in-depth clinical interview. Whilst the CTQ has been shown to be a reliable measure of childhood trauma in individuals with psychosis (Fisher et al., 2009), the DES might not have been an appropriate measure of dissociation in a population with psychosis as it measures everyday non-clinical dissociation. A structured clinical interview such as the Dissociative Disorders Interview Schedule (Ross et al., 1989) might have been more appropriate in order to tap into trauma-related dissociative clinical processes in a more reliable way.

Symptom severity was not taken into account. We therefore cannot exclude the potential confounding influence of overlapping psychotic symptoms on DES data. Experiencing positive symptoms such as hallucinations may have inflated the reporting of dissociative experiences, such as on the depersonalisation subscale on items such as “Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things they are doing.”. DES items on the amnesia subscale such as “Some people find evidence that they have done things that they do not remember doing” may have been interpreted as relating to cognitive impairments such as memory deficits. One study found childhood sexual abuse to be associated with more severe working memory deficits in 15 adults with psychosis spectrum disorders (Lysaker et al., 2001). The stronger association between CTQ and DES in the chronic sample may therefore be accounted for by decreased memory functioning associated with childhood trauma.

Measuring dissociation at only one time point fails to take into account its dynamic aspects, which might be better captured by experience sampling methods. Important information regarding the traumatic experience such as age, duration and relationship to perpetrator was not collected. This paper did not test if dissociation mediates or moderates between childhood trauma and specific symptom dimensions.

An improved study design would measure dissociation using ESM methods, control for intellectual, working memory and executive functioning and assess for both psychotic symptoms, posttraumatic stress and other clinical relevant dissociative symptoms using standardised clinical interviews and exclude controls who met diagnostic criteria for a psychiatric disorder. This would allow for childhood trauma to be regressed on the different symptom dimensions including both clinical and everyday dissociation.

Paper 2 found a significant difference in cortisol after waking between chronic psychosis patients with and without moderate to severe childhood trauma of large effect. Greater childhood trauma was associated with lower cortisol. A more recent study using a first episode sample reported

diametrically opposed results demonstrating hypersecretion of cortisol in traumatised patients compared to non-traumatised patients (Mondelli et al., 2010). As posited by Shah & Malla (2015) the divergence of results might be partly explained by the stage of illness. Participants in the Mondelli study had only experienced their first episode, which is thought to be marked by a hyperactivation of the HPA-axis. Participants in our study, on the other hand, had a mean duration of illness of 11.64 years and could therefore be considered chronic, which is thought to be marked by hypoactivation of the HPA axis. Whilst this might explain part of the divergence in findings, it does not explain the clear difference in CAR between chronic patients with and without childhood trauma. Alternative explanations for the differences might be due to non-compliance with the sampling of the diurnal salivary cortisol. Adequate sampling requires the participant to abstain from eating, drinking, smoking and brushing teeth within the first hour after waking. The research assistant aimed to increase compliance by giving very detailed and concrete instructions and paying participants only after returning all samples. Findings may have further been confounded by differential effects of medication on cortisol. If chronic stress is thought to lead to a blunted cortisol response, then other more recent stressors might also contribute to the lowered response in addition to more distal childhood trauma experiences.

Future studies might want to include a larger sample with an equal representation of men and women to take account of potential sex differences, might want to control for stressful life events occurring over past 6 months as well as current subjective stress on the day of testing, control for medication and homogenise the sample as to include only participants who take medication with the same known effect on HPA-axis functioning and to increase compliance. The current statistical analysis of testing group differences could be improved by using continuous scores of CT in order to run multiple regressions. A larger sample size would allow for the different types of stressors to be regressed onto Cortisol After Awakening or Total Diurnal Cortisol in a step-wise fashion starting with the most distal (childhood) followed by more recent stressors (traumatic

experiences as adult, stress over past 6 months, stress on day of testing) to test for cumulative effects on cortisol.

Thirdly, the design of the qualitative study (Paper 3) precludes us from making any causal inferences between mentalization and recovery. Young people with better adaptation may have simply experienced less threat, loss and challenges than those who described more difficulties with adaptation. Other distal (early trauma) and proximal factors (current level of symptoms, other stressors) may have also accounted for the differences in adaptation and coping ability. Whilst we interpreted the differences in mentalization to reflect underlying differences in emotion regulation, these differences may also be partly accounted for by differences in neurocognition as one study found better mentalization (understanding of one's mind and self-reflective capacity) to be associated with better neurocognition (Lysaker et al., 2005).

Grounded theory narratives were analysed for themes by the first author. The co-author rated the Adult Attachment Interviews for Reflective Functioning as per a standardised coding procedure. The first author also applied this RF coding structure to the grounded theory interview and those rated sections were cross-validated by the co-author. Even though the identity of participants was not revealed to the co-author, he knew most of the participants from clinical team discussions or from direct clinical contact which might have introduced some bias into the RF coding in the AAI and the cross-validation of the RF coding in the grounded theory interviews. Furthermore, the first author – unlike the co-author - had not completed reliability training in RF at the time of analysis.

Future studies of mentalisation or metacognition might want to control for neurocognitive functioning - especially verbal memory - and should ensure that all raters have successfully completed reliability training. Raters should be blind. Independent raters should rate a subsample of at least 20% of RF interviews to ensure interrater reliability is sufficient (at least 80% agreement) as is recommended by the developers of the RF scale. In the meantime a more psychosis-specific interview has been



developed to assess the complexity of metacognition in this population, which might be more appropriate to use (Lysaker & Dimaggio, 2014).

The main limitation of Paper 4 is that it proposes a model for which there was only indirect evidence at this stage.

The feasibility study (Paper 5) suffered from several methodological shortcomings.

Patients who lacked a basic ability to identify emotions were excluded as we required individuals to agree with the treatment rationale, which was to learn to better deal with the negative emotional and interpersonal impact the psychosis has had on their lives. This may have skewed our sample towards being more psychologically-minded and motivated to receive help compared to the general psychosis population. Other research has similarly noted this trend for “help seekers” to be included in trials (Peters et al., 2010). TAU in the community as a control condition was difficult to regulate as a reorganization of community mental health services took place during the study period. As a result, TAU showed great variability both between and within groups. Furthermore, psychiatric diagnosis was based on case note review not on a diagnostic interview. No formal checks of treatment fidelity, therapist competence, and maintenance of blinding were conducted. No follow-up assessments were conducted. Whilst the sample size was appropriate for our goal of identifying important signals of change associated with CFT, it did not permit us to investigate possible clustering effects of groups. A further methodological problem was an apparent imbalance between the two groups in terms of levels of depression prior to randomization. The TAU group had significantly higher levels of depression. This was an important problem given the importance of depression as an outcome of CFT. However, we showed that changes in depression were correlated with changes in compassion in the CFT group, but not the TAU group and that the difference between correlations was statistically significant.

Due to data not being normally distributed, non-parametric tests of differences were used which prevented us from conducting an overall

analysis of group by treatment condition. A repeated-measures ANCOVA controlling for baseline depression would however have been appropriate to use with the current data set. Such an analysis of covariance was conducted as part of the initial analyses and showed no significant differences between groups on either self-report or narrative measures.

The significant difference between groups in terms of observer-rated improvement showed a large effect size. Whilst we have no reason to question the reliability of the blind rating, the deterioration of the TAU group at follow up may be partly explained by the fact that the study was set up as a wait-list control trial. TAU participants may have exaggerate their symptoms at the time of the follow-up assessment in order to ensure that they were still included in the wait list control treatment.

A future feasibility trial of group CFT would benefit from including a genuine wait-list control design stratifying the sample for level of depression at baseline, formalising blinding procedures, assessing treatment fidelity and triangulating more validated measures including positive outcomes such as quality of life, social functioning. A larger sample would allow for analysis of variance group by treatment and for analysis of clustering effects of groups.

## 6. Conclusions

Findings replicated the strong association between childhood trauma and dissociation in psychosis patients relative to controls highlighting the importance of emotional abuse and suggesting underlying difficulties with regulating distress related to early interpersonal trauma (Paper 1). Lower basal cortisol in patients with childhood trauma appeared to support the presence of emotion regulation difficulties due to early interpersonal trauma on a physiological level (Paper 2). Qualitative findings helped to generate hypotheses about inhibitors and facilitators of recovery and targets for intervention including the moderating role of mentalization (Paper 3). A novel attachment- and compassion-focused model was outlined (Paper 4) and successfully piloted yielding important signals of change such as increases in compassion, which appear to reduce depression and social marginalisation in

particular (Paper 5). This model helped account for inconsistencies in oxytocin studies of psychosis (Paper 6).

In summary, findings extend existing research on emotion regulation in psychosis by supporting links to early interpersonal trauma and attachment and offer a promising novel attachment-and compassion-focused psychological intervention and a comprehensive biopsychosocial framework for further improving emotion regulation and mentalization in people with psychosis.

The established trauma-psychosis link has begun to shift established biological illness paradigms towards a more integrated bio-psycho-social understanding of the etiology and of treatment of psychosis (Read, Cooke BPS 2000, 2015). The 2014 NICE guidelines include a recommendation to “assess for post-traumatic stress disorder and other reactions to trauma because people with psychosis or schizophrenia are likely to have experienced previous adverse events or trauma associated with the development of the psychosis or as a result of the psychosis itself. For people who show signs of post-traumatic stress, follow the recommendations in Post-traumatic stress disorder (NICE clinical guideline 26).” The guideline also acknowledges the importance of treating other affective disorders should they manifest in the context of psychotic symptoms. In summary, it appears that we are moving towards an evidence-based emotion- and compassion-focused model of treatment, which does not treat an illness but supports a person to rebuild a meaningful life within a network of supportive relationships.

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